

7

Outpatient Stroke Rehabilitation Evidence Tables

Robert Teasell MD, Norine Foley MSc, Marina Richardson MSc, Laura Allen MSc, Andreea Cotoi MSc

Last Updated: September 2016

Dr. Robert Teasell

Parkwood Institute, 550 Wellington Road, London, Ontario, Canada, N6C 0A7
Phone: 519.685.4000 • Web: www.ebsr.com • Email: Robert.Teasell@sjhc.london.on.ca

Table of Contents

Table of Contents	2
7.1 Incidence of Stroke in Young Patients	3
7.2 Outpatient Therapy	8
7.2.1 Outpatient Stroke Rehabilitation Provided Within 6 Months of Stroke Onset	11
7.2.2 Outpatient Stroke Rehabilitation Beyond 6 Months of Stroke Onset	15
7.2.3 Home-Based Therapy vs. Hospital-Based Outpatient Therapy	17
References	21

7.1 Incidence of Stroke in Young Patients

Table 7.1 Efficacy of Early Supported Discharge in Stroke Rehabilitation

Author, Year Country PEDro Score	Methods	Outcomes
Rodgers et al. (1997) UK 6 (RCT)	92 of 402 stroke admissions were randomized to receive either early support discharge or conventional care. Eligibility criteria included patients who were not living in nursing home or were severely handicapped prior to stroke, Barthel Index 5-19 at 72 hrs post stroke and medically stable with no other conditions precluding rehabilitation.	Median length of stay (LOS) in hospital was significantly shorter for those receiving early supported discharge (13 vs. 22 days). There were no significant differences in functional outcome measures between the 2 groups.
Rudd et al. (1997) UK 7 (RCT)	331 stroke patients randomized to receive specialist community rehabilitation (CR) for up to 3 months after discharge or to receive conventional hospital and community care (CH). 660 patients from one of the two treating hospitals were screened. Of these, 300 were randomized. It is not clear how many patients were screened from the second treating hospital to recruit the 31 patients randomized. Eligibility criteria included medically stable stroke patients who lived alone and were able to transfer independently or who lived with resident caregiver and were able to transfer with help.	LOS after randomization was significantly shorter for the CR patients than the CH patients (12 vs. 18 days). There were no differences in functional outcomes. No cost savings were realized despite a reduction in hospital bed days.
Duncan et al. (1998) USA 5 (RCT)	20 minimally and moderately impaired stroke patients who had completed inpatient rehabilitation and who 30 to 90 days were after stroke onset were randomized to receive either home based exercise program, 3 x/ wk for 8 wks, or to receive usual post-stroke care. The number of patients screened was not reported.	Effects of the intervention on upper extremity dexterity and functional healthy status were equivocal and no significant differences were noted between the two groups on any of the outcome measures.
Widen Holmqvist et al. (1998) Sweden 7 (RCT)	81 patients were randomized to receive either early supported discharge with continuity of rehabilitation at home for 3 to 4 months or to receive routine rehabilitation service in a hospital, day care and/or outpatient care. Eligibility criteria included patients who were continent, independent in feeding and normal mental functioning with impaired motor function and/or aphasia at one week. 86 of 220 stroke patients screened were eligible. 80% could walk 10 meters +/- cane on study entry.	No significant differences were noted between the two groups on any of the outcome measures.
Ricauda et al. (1998) Italy 3 (RCT)	40 patients were randomized to be managed at home by a home hospitalization service (HHS) or to be managed on a general medical ward (GMW). Eligibility criteria included patients > 65 yrs., living within the catchment area and an informal	HHS patients displayed significant improvement in their functional status and also demonstrated a significant improvement on the Short Portable Mental Status Questionnaire.

	evaluation of family support. The number of patients screened was not reported.	
Ronning and Gulgvog (1998) Sweden 6 (RCT)	251 stroke patients were randomized to in-patient rehab or usual care in the community. All patients with moderate or severe disability (admission Barthel <50) were included (n=114). 30% of patients randomized to the community did not receive any form of organized rehab.	The average length of inpatient rehab was 28 days. When moderate to severe strokes were studied, the hospital group reached a much greater level of functional independence (90 vs. 73 on BI) with fewer dependent patients (BI < 75) and decreased mortality (23% vs. 38%) at 7-month follow-up.
Anderson et al. (2000) Australia 8 (RCT)	86 of 398 patients screened were randomized to receive either early supported discharge with home rehabilitation or conventional rehabilitation. Eligibility criteria included being medically stable, capable of participating in a rehabilitation program, having a home environment suitable for simple modifications and a community rehabilitation team available to provide care and access to a general practitioner.	LOS in hospital was reduced significantly for patients in the early supported discharge group. (15 vs. 30 days). At 6-month follow-up self-reported general health status (SF-36) did not differ between the groups. Caregivers of patients in the home group had significantly lower general mental health component scores on the SF-36. There was a trend towards lower cost in the early supported discharge group.
Indredavik et al. (2000) Norway 7 (RCT)	320 stroke patients were randomized to receive care on an enhanced stroke unit service (ESUS) with an early supported discharge component or an ordinary stroke service (OSUS).	A greater proportion of patients treated in the extended stroke unit was independent (using Rankin scores #2 and BI scores ≤ 95) and had been discharged home (64 vs. 46%). Shorter LOS for patients treated on the extended stroke service (19 vs. 31 days).
Kalra et al. (2000) UK 8 (RCT)	457 patients with moderate/severe stroke randomized to receive care on a stroke unit, care by a stroke team on a general ward or home care.	The odds of dying or being institutionalized at 1 yr were 3.2 times greater for stroke-team and 1.8 times greater for home care patients when compared to stroke unit patients. Barthel Index scores were better for stroke unit patients than for stroke team and home care. Modified Rankin scores were better for stroke unit patients than for stroke team, and home care patients.
Mayo et al. (2000) Canada 7 (RCT)	114 of 1542 admitted stroke patients were randomized after discharge to receive either home intervention or usual post stroke care. Eligibility criteria included patients with persistent motor deficits post stroke with caregivers willing and able to provide live-in care over a 4- week period. At 28 days those stroke patients who still needed >1 assist to walk, or those with cognitive impairment or with disabling coexisting conditions were excluded. Barthel scores were approximately 84 on average.	Duration of hospital stay reduced by 2.6 days (9.8 vs. 12.4) in the home treatment group. Barthel score did not change significantly between the two groups. Home therapy group did better on SF-36 physical health component and a community reintegration score vs. usual care.
von Koch et al. (2000) Sweden 6 (RCT)	6-month follow-up to Widen Holmqvist et al. 1998. 83 patients were randomized to receive early supported discharge and continued rehabilitation at home by specialized team (HRG) or to routine rehabilitation (RRG). Eligibility criteria included patients who had impaired motor capacity and/or dysphagia, were continent and independent in feeding. The number of patients screened was not reported.	Total Lindmark Motor Capacity Assessment score was significantly better in favour of the HRG and Inter-group difference in Barthel Mobility scores significantly better for the HRG.

von Koch et al. (2001) Sweden 6 (RCT)	One-year follow-up study of von Koch et al (2000) assessing mortality, activities of daily living, social activities and motor capacity.	No significant differences in outcomes between the groups.
Bautz-Holter et al. (2002) Norway 8 (RCT)	82 acute stroke patients were randomized to early-supported discharge or conventional rehabilitation services groups. Nottingham EADL was assessed at 3 and 6 mos. Patients who were medically stable with a Barthel ADL score between 5 and 19 at 72 hrs post stroke were eligible to participate. 436 patients were admitted to the stroke unit, during the study period. Randomized patients represented 20% of those screened.	No significant differences in outcomes between the groups. The median LOS was reduced from 31 days to 22 days.
Suwanwela et al. (2002) Thailand 5 (RCT)	102 recent stroke patients with mild stroke (NIHSS < 20), were randomized to receive either hospitalization for 3 days or to conventional 10 day hospitalization followed by home rehabilitation provided by family members and Red Cross volunteers.	There were no differences in functional outcome between the groups, measured by NIH stroke scale scores, BI scores and modified Rankin scores at 6 mos. There were also no differences in the rates of death or dependency between the groups.
Fjaertoft et al. (2003) Norway 7 (RCT)	52-week follow-up to Indredavik et al. (2000) study.	A greater proportion of ESUS patients was independent, defined as a modified Rankin Scale score of ≤ 2 , (56.3% vs. 45.0%, $p=0.045$). There were non-significant improvements in independence, defined as a Barthel Index score of ≥ 95 , favouring ESUS patients (52.5% vs. 46.3%, $p=0.264$).
Teng et al. (2003) Canada 7 (RCT)	Cost and caregiver burden analysis from Mayo et al. (2000).	The total costs after 3 mos. associated with the home care group were significantly less compared to the usual care group (\$7,784 vs. \$11,065 Canadian, $p<0.0001$). Lower caregiver burden scores were associated with home intervention group.
Askim et al. (2004) Norway 7 (RCT)	62 acute stroke patients were randomized to either a ESUS or OSUS, as described by Indredavik et al. 2000. Primary outcome was the proportion of patients who were independent according to Modified Rankin Scale (mRS) (independence = $mRS < \text{or} = 2$) 52 weeks after onset of stroke. Mortality and length of stay were registered during the 52 weeks Secondary outcomes were mRS at 6 and 26 weeks and Barthel Index (BI), Nottingham Health Profile (NHP) and Caregiver Strain Index (CSI) at 6, 26 and 52 weeks.	12 patients (39%) in the ESUS group vs. 16 patients (52%) in the OSUS group were independent according to mRS at 52 weeks ($p = 0.444$). There were no differences between groups on any secondary outcome measure, except less social isolation on NHP in the extended service group at 26 weeks ($p = 0.046$). There were no significant differences in length of stay.
Donnelly et al. (2004) UK 7 (RCT)	113 stroke patients who had been previously residing at home with no pre-existing mental or physical disability were randomized to receive community-based rehabilitation (CBR) (n=59) or inpatient rehabilitation (n=54).	There were no differences on any of the outcomes measured at 12 months (Barthel index, Nottingham ADL, 10-m timed walk, EuroQol, SF-36) or carer strain. Overall patient satisfaction scores were significantly higher in the CBR program. There were no significant differences in costs between the two groups, measured in a subset of patients.

Fjaertoft et al. (2004) Norway 7 (RCT)	Additional analysis from Indredavik et al. (2000) study.	ESUS patients had significantly better quality of life assessed by the Nottingham Health Profile after 52 weeks compared to the OSUS patients (mean scores: 78.9 vs.75.2, p=0.048).
Thorsen et al. (2005) Sweden 7 (RCT)	5-year follow-up to Widen-Holmqvist et al. (1998). Outcome assessment was possible in 54/81 patients originally randomized (67%). There were 30 patients in the home rehabilitation group and 24 patients who remained in the conventional rehabilitation group.	A greater proportion of patients in the intervention group had achieved independence, assessed using the Katz extended ADL instrument, but there were no differences using the Barthel Index. There were no differences between the groups in median Sickness Impact Profile scores, Frenchay Activities Index scores, 9-hole peg test or timed 10 metre walk.
Torp et al. (2006) Denmark 6 (RCT)	Following discharge from inpatient rehabilitation, patients were randomized to two groups. The control group received standard care, which included discharge planning, home care services, day care services and physiotherapy (n=95). Patients in the intervention group received care from an interdisciplinary team, which also coordinated discharge planning and provided a maximum of 10 home visits to provide care/therapy (n=103). The primary outcome assessed was length of hospital stay.	There was a statistically non-significant difference in LOS between the groups (- 4.6 days). Mean LOS was 35.2 days for the intervention group and 39.8 days for the control group. There was no differences in functional status between groups 6 months after discharged, measured by the Barthel Index.
Askim et al. (2006) Norway 7 (RCT)	Additional analysis from Askim et al. (2004). Berg Balance Scale (BBS) scores, walking speed and motor sub scores of the Scandinavian Stroke Scale (SSS) were assessed at baseline, 6, 26 and 52 weeks after stroke onset.	Patients in the OSUS (control) group had significantly faster walking speed at one-week post intervention. There were no other differences in BBS or walking speed between the groups at any of the other evaluation points. All patients with initial severe leg paresis suffered from poor balance one year after stroke. The odds ratio for poor balance was 42.1 (95% CI; 3.5-513.9) among patients with no initial walking ability.
Suwanwela et al. (2007) Thailand No Score	407 acute stroke patients were admitted to an acute stroke unit, characterised by semi-intensive monitoring with early discharge. Their complication rate, mortality and LOS were compared to a historical cohort of patients (n=387) treated on a general medical ward, prior to the implementation of the stroke unit.	Complications during hospital stay including brain edema, hemorrhagic transformation, GI bleeding, pneumonia and pressure sores occurred more frequently among patients treated on the GMW. Mortality was higher among GMW patients (8.8% vs. 2%, p<0.001) LOS was longer for GMW patients (11 vs. 8 days. p<0.001).
Pessah-Rasmussen & Wendel (2009) Sweden No Score	Patients admitted to ESD during the years 1997/98 and 2005/06 were compared with subjects from a national stroke registry.	Patients in both cohorts achieved significant improvements in ADL from the start to the end of the program. Patients admitted to ESD services did not differ from the registry subjects with regard to gender or age, but were less often living alone in 2005-06. There were no differences in the mean hospital LOS in either 1996/97 or 2005/06 and the registry participants. Therapy inputs were reduced during 2005/06 compared with 1997/98.
Ytterberg et al. (2010) Sweden 7 (RCT)	5-year follow-up from Holmqvist et al. 1998 examining changes in perceived health status assessed using the Sickness Impact Profile (SIP). 28	There were no differences in total SIP scores at the end of 1 or 5 years. SIP scores did not change significantly between one and five years in the

	patients in the home rehabilitation group and 22 patients in the conventional rehabilitation group were available for study at 5 years. The differences in SIP scores between groups (early-supported discharge with home-based rehabilitation vs. inpatient rehabilitation) were compared at 3 and 6 months and years 1 and 5 post stroke.	home rehabilitation group whereas it had deteriorated significantly in the conventional rehabilitation group (p=0.05).
Fjaertoft et al. (2011) Norway 7 (RCT)	Additional analysis from Indredavik et al. (2000) study.	At 5 years following randomization, there was no difference in the proportion of patients with mRS scores ≤ 2 between groups (P=0.213). The proportion of patients who were dead or living in institutions was similar. A higher proportion of patients in the ESD group was living at home (46.5% vs. 34.4%, p=0.032). There was a trend toward greater improvement in mRS scores in the ESD group from onset of stroke (38% versus 30%; P=0.106).
Hofstad et al. (2014) Norway RCT PEDro=6 TPS=NA N _{Start} =306 N _{End} =229	Population: Mean age=72.24yr; Gender: Males=169, Females=137. Intervention: Participant were randomly assigned to one of three groups. Early supported discharge group 1 (ESD1) received treatment in a community day unit, ESD group 2 (ESD2) received treatment at home (via home visits from the community health team), and the control group received treatment as usual without any intervention. Assessments were conducted at baseline, at 3 months and t 6 months. Outcomes: Modified Rankin Scale (mRS); National Institute of Health Stroke Scale (NIHSS); Barthel Index (BI for ADLs); patient satisfaction questionnaire.	<ol style="list-style-type: none"> 1. The groups did not differ significantly at any point in the time mean values of the mRS, BI or NIHSS. 2. Within group analyses revealed that at 3 and 6 months, the ESD1 and ESD2 groups significantly improved (p=0.001). 3. Separate analyses revealed that men had better mRS scores than women in all groups together at 3 months (p=0.006), and at 6 months (p=0.006).
Gjelsvik et al. (2014) Norway RCT PEDro=7 TPS _{Mean} =8.6 \pm 5d N _{Start} =167 N _{End} =105	Population: Mean age=70.4 \pm 13.2yr; Gender: Males=95, Females=72. Intervention: Participant were randomly assigned to one of three groups. Early supported discharge group 1 (ESD1) received treatment in a community day unit, ESD group 2 (ESD2) received treatment at home (via home visits from the community health team), and the control group received treatment as usual without any intervention. Assessments were conducted at baseline, and at 3 months. Outcomes: Postural Assessment Scale for Stroke (PASS); Trunk Impairment Scale –modified Norwegian version (TIS-modNV); Functional Ambulation Categories (FACT); Timed Up and Go Test (TUG); 5 meter timed walk (5mTW); modified Rankin Scale (mRS); Barthel Index (BI); National Institute of Health Stroke Scale (NIHSS).	<ol style="list-style-type: none"> 1. Patients who were retested at 3 months demonstrated better scores on the PASS, BI, TUG, and 5mTW compared to those who were not retested. 2. No significant difference was found between groups regarding the PASS. 3. No significant difference was found between groups regarding the length of stay. 4. A significant difference in change between groups was found on the TIS-modNV and for self-reports on walking and ADL. Patients in the home rehabilitation group showed greater trunk control improvement than did those in the day unit and control group. However, pairwise comparison was not significant.

<p>Taule et al. (2015) Norway RCT PEDro=6 TPS=NA N_{Start}=154 N_{End}=103</p>	<p>Population: Median age (range)=73 (29-98)yr; Gender: Males=88, Females=86. Intervention: Participant were randomly assigned to one of three groups. Early supported discharge group 1 (ESD1) received treatment in a community day unit, ESD group 2 (ESD2) received treatment at home (via home visits from the community health team), and the control group received treatment as usual without any intervention. Assessments were conducted at baseline, and at 3 months. Outcomes: Modified Rankin Scale (mRS); Assessment of Motor and Process Skills (AMPS).</p>	<ol style="list-style-type: none"> 1. No significant association was found for ESD groups versus control for improved ADL ability for AMPS however, a significant association was found for the mRS scale (p=0.0.27). 2. Each ESD group had significantly higher odds to be classified as independent compared to the control group. 3. There were no significant group differences in pre-post change ADL ability as measured by the AMPS.
--	---	--

7.2 Outpatient Therapy

Table 7.2 Efficacy of Outpatient Rehabilitation Versus Routine Care

Author, Year Country PEDro Score	Methods	Outcomes
<p>Smith et al. (1981) Australia 5 (RCT)</p>	<p>133 stroke patients were randomized to receive one of three treatments following discharge from inpatient rehabilitation; 1) intensive outpatient rehabilitation, provided for 4 full days, 2) conventional rehab, provided for three ½ days /week and 3) no continued rehabilitation, although they were visited by a “health visitor” on a regular basis. Patients received up to 6 months of therapy.</p>	<p>At both 3 month and 12 month review, patients in the intensive group had better disability scores than those receiving conventional rehab, who in turn had better scores than patients receiving no additional rehabilitation. The greatest gains were achieved in the first three months.</p>
<p>Hui et al. (1995) China 5 (RCT)</p>	<p>128 elderly patients with acute stroke were randomized to inpatient care on a stroke ward under the care of either a neurologist or a geriatric team. Those under the care of neurologists were hospitalized until the attending physician felt that the patients had reached full rehabilitation potential. Patients under the care of the geriatric team were discharged home as soon as the team felt they were able to cope and given follow-up rehabilitation at the day hospital. Family or community support was arranged when necessary for both treatment groups.</p>	<p>There were no differences in the mean BI scores between the two groups at either 3 or 6 months follow-up. However, there was significantly greater improvement in scores from 0-3 months, There were also no differences in assessments of patients’ well-being, sleep problems or depression</p>
<p>Corr et al (1995) UK 6 (RCT)</p>	<p>110 stroke patients were randomized immediately following hospital discharge to either the intervention group receiving further rehabilitation at home by an occupational therapist based on the model of human occupation in addition to any other follow-up services arranged or to the control group that received no special intervention or follow up, although they could receive any available services as required.</p>	<p>More patients in the intervention group than in the control group were independent in feeding and using the telephone as assessed by the Nottingham Extended ADL Index.</p>

Forster and Young (1996) UK 6 (RCT)	240 patients were randomized to receive visits by specialist outreach nurses over 12 months to provide information, advice and support with a minimum of 6 visits during the first 6 months or to a control group that did not receive nurse visits. Patients entered the trial either before discharge home from hospital or within 6 weeks of stroke if not hospitalized initially.	Mildly disabled patients (Barthel Index 15 to 19) who received nurse visit experienced significantly greater improvement on social outcomes at 6 and 12- month follow up compared to control. No significant differences in BI scores between the groups.
Goldberg et al. (1997) USA 5 (RCT)	55 patients randomized to receive either the STAIR program (Stroke Transition After Inpatient Rehabilitation) or a control group receiving standard care, within 2-3 mos following stroke. The STAIR program was a model of care developed to improve post discharge services to stroke survivors and care givers.	Significant improvement was noted on the Functional Independence Measure and Frenchay Activities Index from baseline to 1-year follow-up of the entire sample. No between group comparisons were reported.
Logan et al. (1997) UK 8 (RCT)	111 stroke patients who had been discharged home and been referred to the Social Service occupational therapy department were randomized to receive either enhanced home therapy or regular service.	At 3 months the patients in the enhanced therapy group had significantly higher EADL scores compared to patients receiving usual care. At 6 months there were no differences between the groups on any of the outcome measures.
Walker et al. (1999) UK 7 (RCT)	185 stroke patients randomized to receive either up to 5 months of occupational therapy at home or to receive no intervention (control group) 1-month after their stroke.	Patients receiving home occupational therapy demonstrated significantly better median scores than control subjects on the EADL scale, Barthel Index, the Carer Strain Index (CSI) and on the London Handicap Scale (LHS).
Andersen et al. (2000) Denmark 8 (RCT)	155 stroke patients randomized to one of three home-based therapy groups: 1) Patients in control group received standard aftercare that did not include follow-up home visits; 2) The physician intervention group consisted of three 1-hour home visits after discharge at week 2, 6 and 12 (INT1); 3) home-based physiotherapist intervention during a 6 week period immediately after discharge (INT2).	Readmission rates within 6 months after discharge were significantly lower in the intervention groups than in the control group: INT1 (26%), INT2 (34%), and control (44%).
Gilbertson et al. (2000) UK 8 (RCT)	138 stroke patients, who planned to return home following discharge from hospital were randomized to receive either 6 weeks of domiciliary occupational therapy comprising 10 x 30 to 45 min visits, tailored to recovery goals identified by patient or to receive routine post-stroke follow-up care.	At 8 weeks, 24% of patients in the intervention group experienced a poor global outcome compared to 42% of routine care patients. At 8 weeks, domiciliary care patients' Nottingham Extended ADL scores were significantly higher than the intervention group.
Gilbertson & Langhorne (2000) Scotland 8 (RCT)	Same patients studied from Gilbertson et al. 2000.	Home- based therapy group demonstrated significantly greater changes on Canadian Occupational Performance Measure and satisfaction scores between discharge and 7 weeks. Home-based therapy group exhibited better scores on emotional section of the COOP charts and the occupation (work/leisure) subsection of the LHS at 7 weeks. At 6 months follow up, home- based therapy patients were more likely to report satisfaction with preparation for home at discharge, the quantity of

		information received about rehabilitation and recover and having a contact person regarding problems relating to their stroke.
Wolfe et al. (2000) UK 7 (RCT)	43 patients not admitted to hospital following stroke were randomized to receive either usual community care or home treatment care by a rehabilitation team. Unclear at what point post stroke onset patients were entered into the study.	No significant differences were found between groups on any of the outcome measures including Barthel Index, Nottingham Health Profile, Motricity Index (MI), Mini-Mental State Exam (MMSE), Albert Test, Rivermead Activities of Daily Living (RDL), Frenchay Aphasia Screening Test or the 5m timed walk.
Evans & Hendricks (1993) USA 4 (RCT)	180 patients who were discharged from inpatient rehabilitation for a variety of disabling conditions (stroke 22%) were randomized to receive either subacute rehabilitation at home for two months or routine care (primary medical care only).	No significant differences were found between the two groups on any of the outcomes measures including: FIM, SF-36, Personal Adjustment and role skills (PARS), Mental Health Index (MHI) or Social Support Questionnaire (SSQ).
Walker et al. (2001) UK 7 (RCT)	1-year follow-up from 1999 study. 185 patients initially randomized to receive either OT intervention in the home or no treatment. 147 patients were re-assessed.	The median Nottingham EADL scores of the patients receiving therapy were significantly higher than those who did not receive therapy.
Anderson et al. (2002) Denmark 7 (RCT)	Additional analyses from 2000 study, reporting on the functional outcomes of patients 6 mos. Post discharge.	No statistically significant differences in any of the outcome measurements were found (Functional Quality of Movement Scale, Frenchay Activity Index, and Index of Extended Activities of Daily Living).
Chieu and Man (2004) China 4 (RCT)	53 stroke patients discharged home from inpatient services within the preceding 2 weeks were randomized to receive additional home-based intervention (2-3 visits) in the use of bathing devices (n=30) vs. no intervention (n=23). FIM scores and satisfaction with the technology were assessed at 3 months.	The FIM scores of each group improved significantly over the study period. Although no treatment x time interaction term was provided, the improvement in total FIM scores was greater in the intervention group (+11.4 vs. +9). There was greater satisfaction with using assistive devices in the intervention group. Bathing devices were used more frequently in the intervention group (97% vs. 57%).
Ricauda et al. (2004) Italy 7 (RCT)	120 elderly, acute patients with first-ever, uncomplicated stroke were randomized to either inpatient care on a general medicine ward or to Geriatric Home Hospitalization Services and followed for 6 months.	There was no difference in mortality or functional outcome (measured by FIM) at the end of follow up between groups. Home treated patients had better depression scores, measured by the Geriatric Depression Scale, were more likely to remain at home and had experienced fewer medical complications between groups
McClellan and Ada (2004) Australia 8 (RCT)	26 patients with residual deficits following discharge from physiotherapy services were randomized to an experimental group, a 6 week home-base mobility program, or to a control condition which provided upper limb exercises. Standing (Functional Reach), walking (MAS, item 5) and quality of life (SA-SIP30) were assessed at the end of treatment and again at 14 weeks.	Between week 0 and 6, and week 0 and 14 Functional Reach had improved significantly more in the experimental group. There were no differences in improvements on MAS or SA-SIP30 scores between the two groups.
Sackley et al. (2006) UK 7 (RCT)	12 nursing homes representing 118 patients with moderate to severe stroke were randomized to receive a 3 month occupational therapy program that was client-centred (n=55) or to usual care (n=63). Assessments, conducted at baseline, 3 and	At 6 months, fewer patients in the intervention groups experienced a poor global outcome (51% vs. 76%, p<0.03). There were no other significant differences between groups.

	6 months included BI and poor global outcome, defined as deterioration in BI score or death.	
Welin et al. (2010) Sweden 6 (RCT)	163 patients were randomized to receive continued care following discharge from an acute stroke service to either a stroke outpatient clinic (n=81) or to routine care provided by their general practitioner (n=81). The primary outcome was mortality, assessed at 12 months and again at 3-4 years. Other outcomes included modified Rankin Scale (mRS), BI, Scandinavian Stroke Scale (SSS), depression and perceived health (1-5 scale).	There were no statistically significant differences between groups at either assessment point; however, only mortality was reported at 3-4 year period as a large number of patients in both groups did not return to clinics.
Chaiyawat & Kulkantrakorn (2012b) Thailand 7 (RCT)	60 patients with recent ischemic stroke were randomly assigned to receive either a home rehabilitation program once a month for 6 months with audio-visual materials (intervention group) or usual care (control group). Data was collected from discharge from hospital to 2 years. Outcomes measured included BI, the modified Rankin Scale (mRS) and utility index (EQ-5D). Analyses were adjusted for age, depression, dementia and baseline outcome values.	At 2 years, mean BI scores were significantly improved in the intervention group compared with the control group (97.2 vs. 76.4, p<0.001). The proportion of patients with mRS 0 or 1 was greater in the intervention group (93 vs. 32%, p=0.02).
Chaiyawat & Kulkantrakorn (2012a) Thailand 7 (RCT)	Additional reporting from above study.	Mean Hospital Anxiety and Depression scores were improved to a greater degree among patients in the intervention group: from 16.1 to 9.1 vs. 16.4 to 9.1, p= 0.003). Mean Thai Mini-Mental State Examination in both groups did not significantly differ (24.4 to 24.6 vs 23.8 to 24.1, p= 0.068).
Chumbler et al. (2012) USA 7 (RCT)	48 patients were randomized to either the intervention (n=25) or the control (n=23) group. Intervention lasted 3 months and involved 3 televisits (involved prescribing strength and balance exercises), an in-home messaging device (to facilitate outcome assessment and offer encouragement to patient to increase adherence to prescribed exercises), and 5 telephone calls (to explore barriers to completing exercises, advancing and reviewing the exercise program). Outcomes were assessed at baseline, 3 months and 6 months and included the motor subscale of the FIM, and the Late-Life Function and Disability instrument (LLFDI) – overall function component.	There were no statistically significant differences in primary outcomes between the two groups (p>0.05). There were statistically significant improvements in some secondary outcomes, including task difficulty and personal role frequency (subcomponents of the disability component of the LLFDI) suggesting that patients in the intervention group had greater ability to perform life tasks.

7.2.1 Outpatient Stroke Rehabilitation Provided Within 6 Months of Stroke Onset

Table 7.2.1 Efficacy of Outpatient Rehabilitation Versus Routine Care

Author, Year Country PEDro Score	Methods	Outcomes
Smith et al. (1981) Australia	133 stroke patients were randomized to receive one of three treatments following discharge from	At both 3 month and 12 month review, patients in the intensive group had better disability scores than

5 (RCT)	inpatient rehabilitation; 1) intensive outpatient rehabilitation, provided for 4 full days, 2) conventional rehab, provided for three ½ days /week and 3) no continued rehabilitation, although they were visited by a “health visitor” on a regular basis. Patients received up to 6 months of therapy.	those receiving conventional rehab, who in turn had better scores than patients receiving no additional rehabilitation. The greatest gains were achieved in the first three months.
Hui et al. (1995) China 5 (RCT)	128 elderly patients with acute stroke were randomized to inpatient care on a stroke ward under the care of either a neurologist or a geriatric team. Those under the care of neurologists were hospitalized until the attending physician felt that the patients had reached full rehabilitation potential. Patients under the care of the geriatric team were discharged home as soon as the team felt they were able to cope and given follow-up rehabilitation at the day hospital. Family or community support was arranged when necessary for both treatment groups.	There were no differences in the mean BI scores between the two groups at either 3 or 6 months follow-up. However, there was significantly greater improvement in scores from 0-3 months, There were also no differences in assessments of patients’ well-being, sleep problems or depression
Corr et al (1995) UK 6 (RCT)	110 stroke patients were randomized immediately following hospital discharge to either the intervention group receiving further rehabilitation at home by an occupational therapist based on the model of human occupation in addition to any other follow-up services arranged or to the control group that received no special intervention or follow up, although they could receive any available services as required.	More patients in the intervention group than in the control group were independent in feeding and using the telephone as assessed by the Nottingham Extended ADL Index.
Forster and Young (1996) UK 6 (RCT)	240 patients were randomized to receive visits by specialist outreach nurses over 12 months to provide information, advice and support with a minimum of 6 visits during the first 6 months or to a control group that did not receive nurse visits. Patients entered the trial either before discharge home from hospital or within 6 weeks of stroke if not hospitalized initially.	Mildly disabled patients (Barthel Index 15 to 19) who received nurse visit experienced significantly greater improvement on social outcomes at 6 and 12- month follow up compared to control. No significant differences in BI scores between the groups.
Goldberg et al. (1997) USA 5 (RCT)	55 patients randomized to receive either the STAIR program (Stroke Transition After Inpatient Rehabilitation) or a control group receiving standard care, within 2-3 mos following stroke. The STAIR program was a model of care developed to improve post discharge services to stroke survivors and care givers.	Significant improvement was noted on the Functional Independence Measure and Frenchay Activities Index from baseline to 1-year follow-up of the entire sample. No between group comparisons were reported.
Logan et al. (1997) UK 8 (RCT)	111 stroke patients who had been discharged home and been referred to the Social Service occupational therapy department were randomized to receive either enhanced home therapy or regular service.	At 3 months the patients in the enhanced therapy group had significantly higher EADL scores compared to patients receiving usual care. At 6 months there were no differences between the groups on any of the outcome measures.
Walker et al. (1999) UK 7 (RCT)	185 stroke patients randomized to receive either up to 5 months of occupational therapy at home	Patients receiving home occupational therapy demonstrated significantly better median scores than control subjects on the EADL scale, Barthel Index, the

	or to receive no intervention (control group) 1-month after their stroke.	Carer Strain Index (CSI) and on the London Handicap Scale (LHS).
Andersen et al. (2000) Denmark 8 (RCT)	155 stroke patients randomized to one of three home-based therapy groups: 1) Patients in control group received standard aftercare that did not include follow-up home visits; 2) The physician intervention group consisted of three 1-hour home visits after discharge at week 2, 6 and 12 (INT1); 3) home-based physiotherapist intervention during a 6 week period immediately after discharge (INT2).	Readmission rates within 6 months after discharge were significantly lower in the intervention groups than in the control group: INT1 (26%), INT2 (34%), and control (44%).
Gilbertson et al. (2000) UK 8 (RCT)	138 stroke patients, who planned to return home following discharge from hospital were randomized to receive either 6 weeks of domiciliary occupational therapy comprising 10 x 30 to 45 min visits, tailored to recovery goals identified by patient or to receive routine post-stroke follow-up care.	At 8 weeks, 24% of patients in the intervention group experienced a poor global outcome compared to 42% of routine care patients. At 8 weeks, domiciliary care patients' Nottingham Extended ADL scores were significantly higher than the intervention group.
Gilbertson & Langhorne (2000) Scotland 8 (RCT)	Same patients studied from Gilbertson et al. 2000.	Home-based therapy group demonstrated significantly greater changes on Canadian Occupational Performance Measure and satisfaction scores between discharge and 7 weeks. Home-based therapy group exhibited better scores on emotional section of the COOP charts and the occupation (work/leisure) subsection of the LHS at 7 weeks. At 6 months follow up, home-based therapy patients were more likely to report satisfaction with preparation for home at discharge, the quantity of information received about rehabilitation and recover and having a contact person regarding problems relating to their stroke.
Wolfe et al. (2000) UK 7 (RCT)	43 patients not admitted to hospital following stroke were randomized to receive either usual community care or home treatment care by a rehabilitation team. Unclear at what point post stroke onset patients were entered into the study.	No significant differences were found between groups on any of the outcome measures including Barthel Index, Nottingham Health Profile, Motricity Index (MI), Mini-Mental State Exam (MMSE), Albert Test, Rivermead Activities of Daily Living (RDL), Frenchay Aphasia Screening Test or the 5m timed walk.
Evans & Hendricks (1993) USA 4 (RCT)	180 patients who were discharged from inpatient rehabilitation for a variety of disabling conditions (stroke 22%) were randomized to receive either subacute rehabilitation at home for two months or routine care (primary medical care only).	No significant differences were found between the two groups on any of the outcomes measures including: FIM, SF-36, Personal Adjustment and role skills (PARS), Mental Health Index (MHI) or Social Support Questionnaire (SSQ).
Walker et al. (2001) UK 7 (RCT)	1-year follow-up from 1999 study. 185 patients initially randomized to receive either OT intervention in the home or no treatment. 147 patients were re-assessed.	The median Nottingham EADL scores of the patients receiving therapy were significantly higher than those who did not receive therapy.
Anderson et al. (2002) Denmark 7 (RCT)	Additional analyses from 2000 study, reporting on the functional outcomes of patients 6 mos. Post discharge.	No statistically significant differences in any of the outcome measurements were found (Functional Quality of Movement Scale, Frenchay Activity Index, and Index of Extended Activities of Daily Living).

Chieu and Man (2004) China 4 (RCT)	53 stroke patients discharged home from inpatient services within the preceding 2 weeks were randomized to receive additional home-based intervention (2-3 visits) in the use of bathing devices (n=30) vs. no intervention (n=23). FIM scores and satisfaction with the technology were assessed at 3 months.	The FIM scores of each group improved significantly over the study period. Although no treatment x time interaction term was provided, the improvement in total FIM scores was greater in the intervention group (+11.4 vs. +9). There was greater satisfaction with using assistive devices in the intervention group. Bathing devices were used more frequently in the intervention group (97% vs. 57%).
Ricauda et al. (2004) Italy 7 (RCT)	120 elderly, acute patients with first-ever, uncomplicated stroke were randomized to either inpatient care on a general medicine ward or to Geriatric Home Hospitalization Services and followed for 6 months.	There was no difference in mortality or functional outcome (measured by FIM) at the end of follow up between groups. Home treated patients had better depression scores, measured by the Geriatric Depression Scale, were more likely to remain at home and had experienced fewer medical complications between groups
McClellan and Ada (2004) Australia 8 (RCT)	26 patients with residual deficits following discharge from physiotherapy services were randomized to an experimental group, a 6 week home-base mobility program, or to a control condition which provided upper limb exercises. Standing (Functional Reach), walking (MAS, item 5) and quality of life (SA-SIP30) were assessed at the end of treatment and again at 14 weeks.	Between week 0 and 6, and week 0 and 14 Functional Reach had improved significantly more in the experimental group. There were no differences in improvements on MAS or SA-SIP30 scores between the two groups.
Sackley et al. (2006) UK 7 (RCT)	12 nursing homes representing 118 patients with moderate to severe stroke were randomized to receive a 3 month occupational therapy program that was client-centred (n=55) or to usual care (n=63). Assessments, conducted at baseline, 3 and 6 months included BI and poor global outcome, defined as deterioration in BI score or death.	At 6 months, fewer patients in the intervention groups experienced a poor global outcome (51% vs. 76%, p<0.03). There were no other significant differences between groups.
Welin et al. (2010) Sweden 6 (RCT)	163 patients were randomized to receive continued care following discharge from an acute stroke service to either a stroke outpatient clinic (n=81) or to routine care provided by their general practitioner (n=81). The primary outcome was mortality, assessed at 12 months and again at 3-4 years. Other outcomes included modified Rankin Scale (mRS), BI, Scandinavian Stroke Scale (SSS), depression and perceived health (1-5 scale).	There were no statistically significant differences between groups at either assessment point; however, only mortality was reported at 3-4 year period as a large number of patients in both groups did not return to clinics.
Chaiyawat & Kulkantrakorn (2012b) Thailand 7 (RCT)	60 patients with recent ischemic stroke were randomly assigned to receive either a home rehabilitation program once a month for 6 months with audio-visual materials (intervention group) or usual care (control group). Data was collected from discharge from hospital to 2 years. Outcomes measured included BI, the modified Rankin Scale (mRS) and utility index (EQ-5D). Analyses were adjusted for age, depression, dementia and baseline outcome values.	At 2 years, mean BI scores were significantly improved in the intervention group compared with the control group (97.2 vs. 76.4, p<0.001). The proportion of patients with mRS 0 or 1 was greater in the intervention group (93 vs. 32%, p=0.02).
Chaiyawat & Kulkantrakorn	Additional reporting from above study.	Mean Hospital Anxiety and Depression scores were improved to a greater degree among patients in the

(2012a) Thailand 7 (RCT)		intervention group: from 16.1 to 9.1 vs. 16.4 to 9.1, p= 0.003). Mean Thai Mini-Mental State Examination in both groups did not significantly differ (24.4 to 24.6 vs 23.8 to 24.1, p= 0.068).
Chumbler et al. (2012) USA 7 (RCT)	48 patients were randomized to either the intervention (n=25) or the control (n=23) group. Intervention lasted 3 months and involved 3 televisits (involved prescribing strength and balance exercises), an in-home messaging device (to facilitate outcome assessment and offer encouragement to patient to increase adherence to prescribed exercises), and 5 telephone calls (to explore barriers to completing exercises, advancing and reviewing the exercise program). Outcomes were assessed at baseline, 3 months and 6 months and included the motor subscale of the FIM, and the Late-Life Function and Disability instrument (LLFDI) – overall function component.	There were no statistically significant differences in primary outcomes between the two groups (p>0.05). There were statistically significant improvements in some secondary outcomes, including task difficulty and personal role frequency (subcomponents of the disability component of the LLFDI) suggesting that patients in the intervention group had greater ability to perform life tasks.

7.2.2 Outpatient Stroke Rehabilitation Beyond 6 Months of Stroke Onset

Table 7.2.2.1 Efficacy of Outpatient Therapy Delivered Beyond 6 Months of Stroke Onset

Author, Year, Country PEDro Score	Methods	Outcomes
Wade et al. (1992) UK 6 (Crossover RCT)	94 stroke patients with reduced mobility 1 year following stroke were randomized to one of 2 home therapy groups: 1) patients who received physiotherapy immediately upon entry into the study, continuing for 3 months followed by no therapy for 3 months or 2) received no therapy for 3 months followed by therapy for 3 months. Treatment emphasized self-management.	Immediately following treatment, both groups demonstrated a significant improvement in gait speed. At 3 months, the early therapy group showed a significant improvement in gait speed. Between 3-6 months, patients in the late therapy group showed a significant improvement in gait speed.
Werner and Kessler (1996) USA 6 (RCT)	49 stroke survivors, at least 1 yr (mean, 2.9 yr) post stroke, were randomized to receive 1 hr each of physical and occupational therapy, four times per week, for 12 wk; therapy focused on neuromuscular facilitation and functional tasks, or to a group that received no additional treatment. Assessments were conducted at baseline, 3 and 9 months and included FIM, Brunnstrom stages of motor recovery, timed mobility tasks, and the Jebson hand evaluation, level of depression, self-esteem, and socialization.	The patients in the treatment group demonstrated significantly greater improvement in FIM (motor) scores at 3 months; however, there were no longer significant between group differences at 9 months. The treated group improved in terms of socialization and self-esteem as evidenced by a lower Sickness Impact Profile, whereas the controls tended to get worse. There was a trend toward less depression.
Walker et al. (1996) UK 6 (crossover RCT)	30 stroke patients living at home experiencing difficulty with dressing 6 months following stroke were studied. Patients received regular dressing practice by	Group 1 showed significant improvement in dressing during treatment phase with gains maintained during the control phase. Group 2 significantly improved in dressing during the treatment phase. Group 1

	a senior OT in their home for 3 months followed by 3 months of no intervention. 15 patients were randomized to receive assistance for 3 months followed by no assistance (group 1) and 15 patients received no assistance, followed by assistance (group 2).	improved significantly over the treatment phase on the ADL self-care section with gains maintained after the non-intervention period. Group 2 showed significant improvement in ADL scores with treatment.
Parker et al. (2001) UK 6 (RCT)	A multicentre trial of 466 stroke patients randomized to three groups. Two treatment groups received OT intervention at home for up to 6 months with a minimum of 10 sessions lasting not less than 30 min. ADL group treatment goals were set in terms of improving independence in self care tasks. Leisure group goals were set in terms of leisure activity and intervention included practising the leisure activity and the ADL task required to achieve the leisure objectives. Control group received no therapy treatment.	No significant differences were found between groups on any of the outcome measures including the General Health Questionnaire (GHQ), Nottingham Extended ADL Scale, Nottingham Leisure Questionnaire, International Stroke Trial Outcome Questions, Barthel Index or London Handicap Scale (LHS).
Green et al. (2002) UK 8 (RCT)	170 stroke patients > 50 years with mobility problems one year following stroke were randomized to receive community physiotherapy treatment or to a no treatment control group. Patients in the treatment group were seen for a maximum of 13 weeks.	There was a difference in Rivermead mobility index (RMI) scores at 3 months, after adjusting for differences in baseline gait speed. However, there were no longer differences in RMI scores between the groups at 6 or 9 months. Treatment had no effect on patients' daily activity, social activity, anxiety, depression, and number of falls, or on emotional stress of carers.
Lin et al. (2004) Taiwan 7 (RCT)	19 patients received home-based physical therapy once a week for 10 consecutive weeks. Each treatment session lasting 50-60 minutes consisted of motor facilitation, postural control training, ambulation training and ADL training. This was a cross-over designed study, where patients were randomized to receive the treatment either immediately or after 10 weeks delay.	Motor function was assessed using the Stroke Rehabilitation Assessment of Movement (STREAM). STREAM assesses 3 subscales assessing upper limb/lower limb movements and basic mobility items. ADL was assessed using the 20 point BI. Although there were no differences in the mean BI or STREAM scores between the two groups at either 11 or 22 weeks, at 11 weeks, Group I showed greater improvement in lower limb motor function than Group II. At the second follow-up assessment at 22 weeks, Group II showed improvement while Group I had declined. At 22 weeks, the motor function of upper limbs, mobility, and ADL performance in Group II had improved slightly more than in Group I.
Logan et al. (2004) UK 8 (RCT)	168 patients were randomized to a home-based occupational therapy intervention group or to a control condition. Patients in the intervention group reviewed mobility goals with an occupational therapist and received up to 7 treatment sessions over 3 months. Patients in the control group received leaflets describing local transport services for disabled persons. The response to the query "do you get out of the house as much as you would like?" was the main	The percentage of patients in the experimental group reported getting out of the house more at both 4 and 10 months, compared to patients in the control group (56 vs. 30% and 53 vs. 33%, respectively). The median number of outdoor journeys was higher at both 4 and 10 months for patients in the experimental group (37 vs. 14 and 42 vs. 14, respectively) The 4 month Nottingham EADL scores were higher for patients in the intervention group. There were no other significant differences between groups.

	outcome. Secondary measures response to the query “how many journeys outdoors have you taken in the last month?”, as well as scores on the Nottingham EADL and Nottingham Leisure Questionnaire.	
Egan et al. (2007) Canada 7 (RCT)	16 subjects discharged from inpatient rehabilitation 6 months previously were enrolled in a study examining the effectiveness of community-based occupational therapy. Subjects in the intervention group (n=8) received up to 8 visits from the study OT over 2 to 4 months to work on issues related to improving participation. Subjects in the control group (n=8) received usual (no care). The primary outcome was the Canadian Model of Occupational Performance (COPM).	There were no differences in the mean COPM (performance subscale) change scores between groups (1.5 vs. 1.3). There was a significant difference in the mean COPM (satisfaction subscale) score favouring the intervention group (3.9 vs. 1.9).

7.2.3 Home-Based Therapy vs. Hospital-Based Outpatient Therapy

Table 7.2.3 Home vs. Hospital-Based Outpatient Therapy

Author, Year Country PEDro Score	Methods	Outcomes
Gersten et al. (1968) USA 5 (RCT)	238 stroke patients were randomly assigned to receive rehabilitation at home or in a clinic setting.	128 completed the study. No differences in the functional, social or psychological status of patients in the 2 groups.
Wall and Turnbull (1987) Canada 3 (RCT)	Following discharge from hospital 20 subjects with residual hemiplegia were randomly assigned to one of 4 groups to participate in a 6 mos, twice weekly, 2 hrs/week progressive exercise program including 10 exercises. Group A received all therapy in a clinic, group B received all therapy at home, group C received 1 hour of therapy in clinic and 1 hour at home under the supervision of a spouse and subjects in group C received no additional therapy. Gait symmetry and speed were assessed monthly at up to 3 months following end of treatment.	There were no significant differences among groups at any time point, for any of the outcome measures. There were significant improvements within all intervention groups on 1 single testing time compared with baseline values in gait speed and one of the 2 measures used to assess gait symmetry, although none were statistically significant from baseline to end of treatment.
Young and Forster (1992) UK 6 (RCT)	124 stroke patients were randomized to attend a geriatric day hospital twice weekly for post-stroke care or to be treated at home by one of five experienced community physiotherapists.	A significantly greater proportion of home physiotherapy patients were assessed as independent by the Barthel Index, the Motor Club Assessment (MCA), and the Functional Ambulatory Category (FAC).
Gladman et al. (1993) UK 6 (RCT)	327 stroke patients were randomized to receive domiciliary service for up to 6 months or hospital-based rehabilitation services.	Domiciliary group showed significantly greater performance on Extended ADL household and leisure sub-scores at 6 months.
Gladman et al. (1994) UK 6 (RCT)	Follow up of 1993 study reporting outcomes between 6-months and one-year after discharge.	Relative risk of death or institutionalization in the domiciliary group was 1.6 after one year.

<p>Baskett et al. (1999) New Zealand 7 (RCT)</p>	<p>100 patients were randomized to receive either weekly visits by an occupational therapist and/or physiotherapist who prescribed a program of exercises and activities or to receive outpatient/day hospital therapy.</p>	<p>Change in BI score was significantly better for the hospital therapy group compared to the home therapy group between entry and exit from the study. There were no other significant differences between the groups.</p>
<p>Roderick et al. (2001) UK 7 (RCT)</p>	<p>140 stroke patients were randomized to receive rehabilitation through either home rehab or geriatric day hospital. Randomization was stratified by sex, age and disability level.</p>	<p>No significant differences noted between the 2 groups on the Barthel Index, Rivermead Mobility Index, Frenchay Activities Index, at 6 months.</p>
<p>Lincoln et al. (2004) UK 7 (RCT)</p>	<p>428 stroke patients and their carers were randomized to rehabilitation from a community stroke team or to routine care, which could include day hospitals or outpatient departments. Most patients in the treatment group were referred upon discharged from inpatient rehabilitation.</p>	<p>There were no significant differences between patients who received rehabilitation from community stroke team and those who received routine care in their independence in activities of daily living, mood, quality of life or knowledge of stroke. Patients in the community stroke team group were more satisfied with the emotional support they had received. There were no significant differences between the groups in satisfaction with practical help or overall satisfaction. Carers of patients in the community stroke team were under less strain than carers in the routine care group. Carers of patients in the community stroke team group reported greater levels of overall satisfaction.</p>
<p>Bjorkdahl et al. (2006) Sweden 8 (RCT)</p>	<p>59 patients discharged from inpatient rehabilitation programs were randomized to receive additional rehabilitation (occupational and physical therapy) that was home based (HB) (n=30) or day hospital (DH) (n=29). Patients in both groups received 9 hours of training per week for 3 weeks. Patients in the HB group were offered training based on their own needs (i.e. personal care, shopping) while those in the DH group received care that that was more-impairment- oriented. The Assessment of Motor & Process Skills (AMPS) FIM, Instrumental Activity Measure (IAM) and the National Institutes of Health Stroke Scale (NIHSS) and Barrow Neurological Institutes Screening (BNIS) were assessed at discharge from hospital, 3 weeks, 3 months and 1 year.</p>	<p>There were no significant differences between groups on any of the outcomes assessed. Both groups achieved modest gains in most of the outcome measure assessed. The costs associated with HB rehabilitation were lower.</p>
<p>Lord et al. (2008) New Zealand 7 (RCT)</p>	<p>Three hospitals and three community settings in New Zealand. 32 subjects discharged from 3 inpatient rehabilitation units were randomly allocated to receive additional rehabilitation in the community (led by an assistant physiotherapist)(n = 14) or at hospital outpatients (led by a physiotherapist)(n = 16) twice a week for seven weeks. The community intervention involved practice of functional gait activities in community environments relevant to each participant. Hospital-based</p>	<p>Participants in both groups received an average of 13 treatments. Subjects in both groups achieved large gains in 10MTW from baseline to end of treatment. Community group mean: 27.8 to 43.9 m/min compared with the hospital-based group mean: 27.6 to 43.6 m/min. There were no significant differences between groups (P = 0.86). Only 11 participants reported independent community ambulation.</p>

	<p>physiotherapy was based upon a Motor Relearning approach. The primary outcome measure was gait speed assessed using the 10-m timed walk (10MTW)(m/min), before and after intervention and at 6 months follow-up.</p>	
<p>Redzuan et al. (2012) Malaysia 3 (RCT)</p>	<p>106 patients admitted to hospital with stroke who had a caregiver and were discharged from a neurology ward were randomized to an intervention or control group. Intervention involved the use of a 45 minute self-instructional DVD consisting of 6 areas of therapy (patient positioning and handling, bed mobility, passive range of motion exercise, stretching and strengthening of the upper and lower limbs, transfer techniques, and activities of daily living). Patients in the intervention group received two outpatient therapy sessions per month and the DVD for home use. Patients in the control group received one outpatient therapy session (2 hours) per week and were encouraged to practice the learned skills at home between sessions. Patients' level of independence was assessed using the modified Barthel Index (MBI) at recruitment and 3 month follow-up.</p>	<p>There were no significant differences in the number of patients with improved MBI scores from baseline to 3 month discharge between the groups (60% of patients in the intervention group experienced improved scores while 45.7% of the control group had improved scores) (P=0.202). There were also no differences in the occurrence of stroke related complications or caregiver stress level.</p>
<p>Balci et al. (2013) Turkey RCT PEDro=7 TPS_{mean}=NA N_{start}=25 N_{end}=25</p>	<p>Population: VFPT group (N=6): Median age=58yr; Gender: unspecified. VR group (N=6): Median age=56yr; Gender: unspecified. HE group (N=13): Median age=64.0yr; Gender: unspecified. Intervention: Patients were instructed in an acute inpatient program with balance and mobility exercise until discharge from the hospital. At discharge, patients were randomized to either a rehabilitation or a control (home exercises) group. The rehabilitation group was further randomized into the visual feedback posturography training (VFPT) or the vestibular rehabilitation (VR) group. Assessments were conducted before and after the 6 weeks of training. Outcomes: Berg Balance Scale (BBS); Timed Up and Go (TUG); Dynamic Gait Index (DGI); Dizziness Handicap Inventory (DHI); Centre of Gravity (COG); Limits of Stability (LOS); modified Clinical Test of Sensory Interaction on Balance (mCTSIB).</p>	<ol style="list-style-type: none"> All groups demonstrated a significant improvement from pre-training to post-training on the BBS (VFPT group: p=0.027; VR group: p=0.028; HE group: p=0.003), DHI (VFPT group: p=0.026; VR group: p=0.028; HE group: p=0.005), and on the DGI (VFPT group: p=0.028; VR group: p=0.028; HE group: p=0.005). Only the VR and the HE groups improved from pre- to post-training on the TUG (VR group: p=0.043; HE group: p=0.007). Both the rehabilitation group (VR and VFPT groups combined) and the home group improved significantly on the COG LOS (p=0.008; p=0.011).
<p>Olaleye et al. (2014) Nigeria RCT PEDro=6 TPS_{Mean}=NA</p>	<p>Population: Experimental group I (PHC; N=25): Mean age=60.9±10.2yr; Gender: Male=7, Female=18. Experimental group II (DG; N=27): Mean age=61.7±8.4yr; Gender: Male=17, Female=10.</p>	<ol style="list-style-type: none"> Both PHCG and DG showed a significantly improvement in the MMAS, SF-PASS, and RNLI scores from baseline to the 10wk post-intervention period (all p<0.05).

<p>N_{Start}=56 N_{End}=52</p>	<p>Intervention: Patients were randomized to receive rehabilitative services in either a primary health centre (PHCG) or in their own home/domicile (DG). Both groups were treated twice weekly for 10 consecutive weeks using a physiotherapy intervention protocol comprising of a battery of task specific exercises. Participants were assessed at baseline and at the 10wk period post-intervention.</p> <p>Outcomes: Modified Motor Assessment Scale (MMAS); Short Form-Postural assessment Scale for Stroke (SF-PASS); Reintegration to Normal living Index (RNLI).</p>	<p>2. There was no significant difference between in the MMAS, SF-PASS, and RNLI scores between the PHCG and DG measured at baseline and over the 10wk study period.</p>
<p>Nanninga et al. (2015) Netherlands Observational No Score TPS_{Mean}=NA N_{Start}=33 N_{End}=33</p>	<p>Population: Mean age=57.24±11.24yr; Gender: Male=20, Female=13.</p> <p>Intervention: Participants who are receiving or had received multidisciplinary treatment in a rehabilitation stroke unit were interviewed and asked to reflect on their experiences in the rehabilitation clinic, discharge home and their current lives at home and in the community.</p> <p>Outcomes: Themes pertaining to the clinical phase, post-discharge phase, and reintegration phase.</p>	<p>1. Three different sub-themes were identified by contrasting the three phases that the participants went through: (1) clinical phase: longing for bodily recovery and domestic places; (2) post-discharge phase: longing for pre-stroke activities and roles; (3) reintegration phase: longing for recognition and a new sense of belonging.</p>

References

- Andersen, H. E., Schultz-Larsen, K., Kreiner, S., Forchhammer, B. H., Eriksen, K., Brown, A. (2000). Can readmission after stroke be prevented? Results of a randomized clinical. *Stroke*, 31(5), 1038-1045.
- Anderson, C., Ni Mhurchu, C., Brown, P. M., Carter, K. (2002). Stroke rehabilitation services to accelerate hospital discharge and provide. *Pharmacoeconomics*, 20(8), 537-552.
- Anderson, C., Rubenach, S., Mhurchu, C. N., Clark, M., Spencer, C., Winsor, A. (2000). Home or hospital for stroke rehabilitation? results of a randomized controlled. *Stroke*, 31(5), 1024-1031.
- Askim, T., Morkved, S., Indredavik, B. (2006). Does an extended stroke unit service with early supported discharge have any. *J Rehabil Med*, 38(6), 368-374.
- Askim, T., Rohweder, G., Lydersen, S., Indredavik, B. (2004). Evaluation of an extended stroke unit service with early supported discharge for. *Clin Rehabil*, 18(3), 238-248.
- Balci, B. D., Akdal, G., Yaka, E., Angin, S. (2013). Vestibular rehabilitation in acute central vestibulopathy: a randomized controlled trial. *J Vestib Res*, 23(4-5), 259-267.
- Baskett, J. J., Broad, J. B., Reekie, G., Hocking, C., Green, G. (1999). Shared responsibility for ongoing rehabilitation: a new approach to home-based. *Clin Rehabil*, 13(1), 23-33.
- Bautz-Holter, E., Sveen, U., Rygh, J., Rodgers, H., Wyller, T. B. (2002). Early supported discharge of patients with acute stroke: a randomized controlled. *Disabil Rehabil*, 24(7), 348-355.
- Bjorkdahl, A., Nilsson, A. L., Grimby, G., Sunnerhagen, K. S. (2006). Does a short period of rehabilitation in the home setting facilitate functioning. *Clin Rehabil*, 20(12), 1038-1049.
- Chaiyawat, P., Kulkantrakorn, K. (2012a). Effectiveness of home rehabilitation program for ischemic stroke upon disability. *Clin Neurol Neurosurg*, 114(7), 866-870.
- Chaiyawat, P., Kulkantrakorn, K. (2012b). Randomized controlled trial of home rehabilitation for patients with ischemic. *Psychogeriatrics*, 12(3), 193-199.
- Chieu, C. W. Y., Man, D. W. (2004). The Effect of Training Older Adults With Stroke to Use Home-Based Assistive Devices. *OTJR: Occupation, Participation, Health*, 24(3).
- Chumbler, N. R., Quigley, P., Li, X., Morey, M., Rose, D., Sanford, J., Griffiths, P., Hoenig, H. (2012). Effects of telerehabilitation on physical function and disability for stroke patients: a randomized, controlled trial. *Stroke*, 43(8), 2168-2174.
- Corr, S. (1995). Occupational therapy for stroke patients after hospital discharge — a randomized controlled trial. *Clin Rehabil*, 9(4), 291-296.
- Donnelly, M., Power, M., Russell, M., Fullerton, K. (2004). Randomized controlled trial of an early discharge rehabilitation service: the. *Stroke*, 35(1), 127-133.

- Duncan, P. W., Richards, L., Wallace, D., Stoker-Yates, J., Pohl, P., Luchies, C., Ogle, A., Studenski, S. (1998). A randomized, controlled pilot study of a home-based exercise program for. *Stroke*, 29(10), 2055-2060.
- Egan, M., Kessler, D., Laporte, L., Metcalfe, V., Carter, M. (2007). A pilot randomized controlled trial of community-based occupational therapy in late stroke rehabilitation. *Top Stroke Rehabil.*, 14(5), 37-45.
- Evans, R. L., Hendricks, R. D. (1993). Evaluating hospital discharge planning: a randomized clinical trial. *Med Care*, 31(358-370), 358.
- Fjaertoft, H., Indredavik, B., Johnsen, R., Lydersen, S. (2004). Acute stroke unit care combined with early supported discharge. Long-term effects. *Clin Rehabil*, 18(5), 580-586.
- Fjaertoft, H., Indredavik, B., Lydersen, S. (2003). Stroke unit care combined with early supported discharge: long-term follow-up of. *Stroke*, 34(11), 2687-2691.
- Fjaertoft, H., Rohweder, G., Indredavik, B. (2011). Stroke unit care combined with early supported discharge improves 5-year outcome. *Stroke*, 42(6), 1707-1711.
- Forster, A., Young, J. (1996). Specialist nurse support for patients with stroke in the community: a randomised. *Bmj*, 312(7047), 1642-1646.
- Gersten, J. W., Miller, B., Cenkovich, F., Dinken, H. (1968). Comparison of home and clinic rehabilitation for chronically ill and physically. *Arch Phys Med Rehabil*, 49(11), 615-642.
- Gilbertson, L., Langhorne, P. (2000). Home-Based Occupational Therapy: Stroke Patients' Satisfaction with Occupational Performance and Service Provision. *The British Journal of Occupational Therapy*, 63(10), 464-468.
- Gilbertson, L., Langhorne, P., Walker, A., Allen, A., Murray, G. D. (2000). Domiciliary occupational therapy for patients with stroke discharged from. *Bmj*, 320(7235), 603-606.
- Gjelsvik, B. E., Hofstad, H., Smedal, T., Eide, G. E., Naess, H., Skouen, J. S., Frisk, B., Daltveit, S., Strand, L. I. (2014). Balance and walking after three different models of stroke rehabilitation: early supported discharge in a day unit or at home, and traditional treatment (control). *BMJ Open*, 4(5).
- Gladman, J., Lincoln, N. B. (1994). Follow-up of a controlled trial of domiciliary stroke rehabilitation. *Age Ageing*, 23(1), 9-13.
- Gladman, J., Lincoln, N. B., Barer, D. H. (1993). A randomised controlled trial of domiciliary and hospital-based rehabilitation. *J Neurol Neurosurg Psychiatry*, 56(9), 960-966.
- Goldberg, G., Mary, E. S. P., Stephen, N. B. P., Richard, R. S. P., Arthur, M. G. M. D. (1997). Stroke Transition after Inpatient Rehabilitation. *Topics in Stroke Rehabilitation*, 4(1), 64-79.
- Green, J., Forster, A., Bogle, S., Young, J. (2002). Physiotherapy for patients with mobility problems more than 1 year after stroke. *Lancet*, 359(9302), 199-203.

- Hofstad, H., Gjelsvik, B. E., Naess, H., Eide, G. E., Skouen, J. S. (2014). Early supported discharge after stroke in Bergen (ESD Stroke Bergen): three and six months results of a randomised controlled trial comparing two early supported discharge schemes with treatment as usual. *BMC Neurol*, *14*, 239.
- Hui, E., Lum, C. M., Woo, J., Or, K. H., Kay, R. L. (1995). Outcomes of elderly stroke patients. Day hospital versus conventional medical. *Stroke*, *26*(9), 1616-1619.
- Indredavik, B., Fjaertoft, H., Ekeberg, G., Loge, A. D., Morch, B. (2000). Benefit of an extended stroke unit service with early supported discharge: A. *Stroke*, *31*(12), 2989-2994.
- Kalra, L., Evans, A., Perez, I., Knapp, M., Donaldson, N., Swift, C. G. (2000). Alternative strategies for stroke care: a prospective randomised controlled. *Lancet*, *356*(9233), 894-899.
- Lin, J. H., Hsieh, C. L., Lo, S. K., Chai, H. M., Liao, L. R. (2004). Preliminary study of the effect of low-intensity home-based physical therapy in. *Kaohsiung J Med Sci*, *20*(1), 18-23.
- Lincoln, N. B., Walker, M. F., Dixon, A., Knights, P. (2004). - Evaluation of a multiprofessional community stroke team: a randomized controlled. *Clin Rehabil*, *18*(1), 40-47.
- Logan, P. A., Ahern, J., Gladman, J. R., Lincoln, N. B. (1997). A randomized controlled trial of enhanced Social Service occupational therapy for. *Clin Rehabil*, *11*(2), 107-113.
- Logan, P. A., Gladman, J. R., Avery, A., Walker, M. F., Dyas, J., Groom, L. (2004). Randomised controlled trial of an occupational therapy intervention to increase. *Bmj*, *329*(7479), 1372-1375.
- Lord, S., McPherson, K. M., McNaughton, H. K., Rochester, L., Weatherall, M. (2008). How feasible is the attainment of community ambulation after stroke? A pilot randomized controlled trial to evaluate community-based physiotherapy in subacute stroke. *Clin Rehabil*, *22*(3), 215-225.
- Mayo, N. E., Wood-Dauphinee, S., Cote, R., Gayton, D., Carlton, J., Buttery, J., Tamblyn, R. (2000). There's no place like home : an evaluation of early supported discharge for. *Stroke*, *31*(5), 1016-1023.
- McClellan, R., Ada, L. (2004). A six-week, resource-efficient mobility program after discharge from. *Aust J Physiother*, *50*(3), 163-167.
- Nanninga, C. S., Meijering, L., Schonherr, M. C., Postema, K., Lettinga, A. T. (2015). Place attachment in stroke rehabilitation: a transdisciplinary encounter between cultural geography, environmental psychology and rehabilitation medicine. *Disability and Rehabilitation*, *37*(13), 1125-1134.
- Olaleye, O. A., Hamzat, T. K., Owolabi, M. O. (2014). Stroke rehabilitation: should physiotherapy intervention be provided at a primary health care centre or the patients' place of domicile? *Disabil Rehabil*, *36*(1), 49-54.
- Parker, C. J., Gladman, J. R., Drummond, A. E., Dewey, M. E., Lincoln, N. B., Barer, D., Logan, P. A., Radford, K. A. (2001). A multicentre randomized controlled trial of leisure therapy and conventional. *Clin Rehabil*, *15*(1), 42-52.
- Pessah-Rasmussen, H., Wendel, K. (2009). Early supported discharge after stroke and continued rehabilitation at home. *J Rehabil Med*, *41*(6), 482-488.

- Redzuan, N. S., Engkasan, J. P., Mazlan, M., Freddy Abdullah, S. J. (2012). Effectiveness of a video-based therapy program at home after acute stroke: a randomized controlled trial. *Arch Phys Med Rehabil*, 93(12), 2177-2183.
- Ricauda, N., Fiorio Pla, L., Marinello, R., Molaschi, M., Fabris, F. (1998). Feasibility of an acute stroke home care service for elderly patients. *Archives of gerontology and geriatrics*, 26, 17-22.
- Ricauda, N. A., Bo, M., Molaschi, M., Massaia, M., Salerno, D., Amati, D., Tibaldi, V., Fabris, F. (2004). Home hospitalization service for acute uncomplicated first ischemic stroke in. *J Am Geriatr Soc*, 52(2), 278-283.
- Roderick, P., Low, J., Day, R., Peasgood, T., Mullee, M. A., Turnbull, J. C., Villar, T., Raftery, J. (2001). Stroke rehabilitation after hospital discharge: a randomized trial comparing. *Age Ageing*, 30(4), 303-310.
- Rodgers, H., Soutter, J., Kaiser, W., Pearson, P., Dobson, R., Skilbeck, C., Bond, J. (1997). Early supported hospital discharge following acute stroke: pilot study results. *Clin Rehabil*, 11(4), 280-287.
- Ronning, O. M., Guldvog, B. (1998). Outcome of subacute stroke rehabilitation: a randomized controlled trial. *Stroke*, 29(4), 779-784.
- Rudd, A. G., Wolfe, C. D., Tilling, K., Beech, R. (1997). Randomised controlled trial to evaluate early discharge scheme for patients with. *Bmj*, 315(7115), 1039-1044.
- Sackley, C., Wade, D. T., Mant, D., Atkinson, J. C., Yudkin, P., Cardoso, K., Levin, S., Lee, V. B., Reel, K. (2006). Cluster randomized pilot controlled trial of an occupational therapy intervention. *Stroke*, 37(9), 2336-2341.
- Smith, D. S., Goldenberg, E., Ashburn, A., Kinsella, G., Sheikh, K., Brennan, P. J., Meade, T. W., Zutshi, D. W., Perry, J. D., Reeback, J. S. (1981). Remedial therapy after stroke: a randomised controlled trial. *Br Med J*, 282(6263), 517-520.
- Suwanwela, N. C., Eusattasak, N., Phanthumchinda, K., Piravej, K., Locharoenkul, C. (2007). Combination of acute stroke unit and short-term stroke ward with early supported. *J Med Assoc Thai*, 90(6), 1089-1096.
- Suwanwela, N. C., Phanthumchinda, K., Limtongkul, S., Suvanprakorn, P. (2002). Comparison of short (3-day) hospitalization followed by home care treatment and. *Cerebrovasc Dis*, 13(4), 267-271.
- Taule, T., Strand, L. I., Assmus, J., Skouen, J. S. (2015). Ability in daily activities after early supported discharge models of stroke rehabilitation. *Scand J Occup Ther*, 22(5), 355-365.
- Teng, J., Mayo, N. E., Latimer, E., Hanley, J., S, W.-D., R, C., S, S. (2003). Costs and caregiver consequences of early supported discharge for stroke. *Stroke*, 34(2), 528-536.
- Thorsen, A. M., Holmqvist, L. W., de Pedro-Cuesta, J., von Koch, L. (2005). A randomized controlled trial of early supported discharge and continued. *Stroke*, 36(2), 297-303.
- Torp, C. R., Vinkler, S., Pedersen, K. D., Hansen, F. R., Jorgensen, T., Willaing, I., Olsen, J. (2006). Model of hospital-supported discharge after stroke. *Stroke*, 37(6), 1514-1520.

- von Koch, L., de Pedro-Cuesta, J., Kostulas, V., Almazan, J. (2001). Randomized controlled trial of rehabilitation at home after stroke: one-year follow-up of patient outcome, resource use and cost. *Cerebrovascular Diseases*, 12(2), 131-138.
- von Koch, L., Widen Holmqvist, L., Kostulas, V., Almazan, J., de Pedro-Cuesta, J. (2000). A randomized controlled trial of rehabilitation at home after stroke in Southwest. *Scand J Rehabil Med*, 32(2), 80-86.
- Wade, D. T., Collen, F. M., Robb, G. F., Warlow, C. P. (1992). Physiotherapy intervention late after stroke and mobility. *Bmj*, 304(6827), 609-613.
- Walker, M. F., Drummond, A., Lincoln, N. B. (1996). Evaluation of dressing practice for stroke patients after discharge from hospital: a crossover design study. *Clin Rehabil*, 10(1), 23-31.
- Walker, M. F., Gladman, J. R., Lincoln, N. B., Siemonsma, P., Whiteley, T. (1999). Occupational therapy for stroke patients not admitted to hospital: a randomised. *Lancet*, 354(9175), 278-280.
- Walker, M. F., Hawkins, K., Gladman, J. R., Lincoln, N. B. (2001). Randomised controlled trial of occupational therapy at home: results at 1 year. *J Neurol Neurosurg Psychiatry*, 70(2), MID-11237160.
- Wall, G., Turnbull, T. (1987). Evaluation of Out-patient Physiotherapy and a Home Exercise Program in the Management of Gait Asymmetry in Residual Stroke. *Neurorehabil Neural Repair*, 1(3), 115-123.
- Welin, L., Bjälkefur, K., Roland, I. (2010). Open, randomized pilot study after first stroke: a 3.5-year follow-up. *Stroke*, 41(7), 1555-1557.
- Werner, R. A., Kessler, S. (1996). Effectiveness of an intensive outpatient rehabilitation program for postacute. *Am J Phys Med Rehabil*, 75(2), 114-120.
- Widen Holmqvist, L., von Koch, L., Kostulas, V., Holm, M., Widsell, G., Tegler, H., Johansson, K., Almazan, J., de Pedro-Cuesta, J. (1998). A randomized controlled trial of rehabilitation at home after stroke in southwest. *Stroke*, 29(3), 591-597.
- Wolfe, C. D., Tilling, K., Rudd, A. G. (2000). The effectiveness of community-based rehabilitation for stroke patients who. *Clin Rehabil*, 14(6), 563-569.
- Young, J. B., Forster, A. (1992). The Bradford community stroke trial: results at six months. *Bmj*, 304(6834), 1085-1089.
- Ytterberg, C., Thorsen, A. M., Liljedahl, M., Holmqvist, L. W., von Koch, L. (2010). Changes in perceived health between one and five years after stroke: a randomized. *J Neurol Sci*, 294(1-2), 86-88.