Canadian Stroke Best Practices

CANADIAN STROKE BEST PRACTICE RECOMMENDATIONS

Rehabilitation, Recovery and Community Participation Following Stroke

Part One: Stroke Rehabilitation Planning for Optimal Care Delivery

Evidence Tables

Delivery of Inpatient Stroke Rehabilitation

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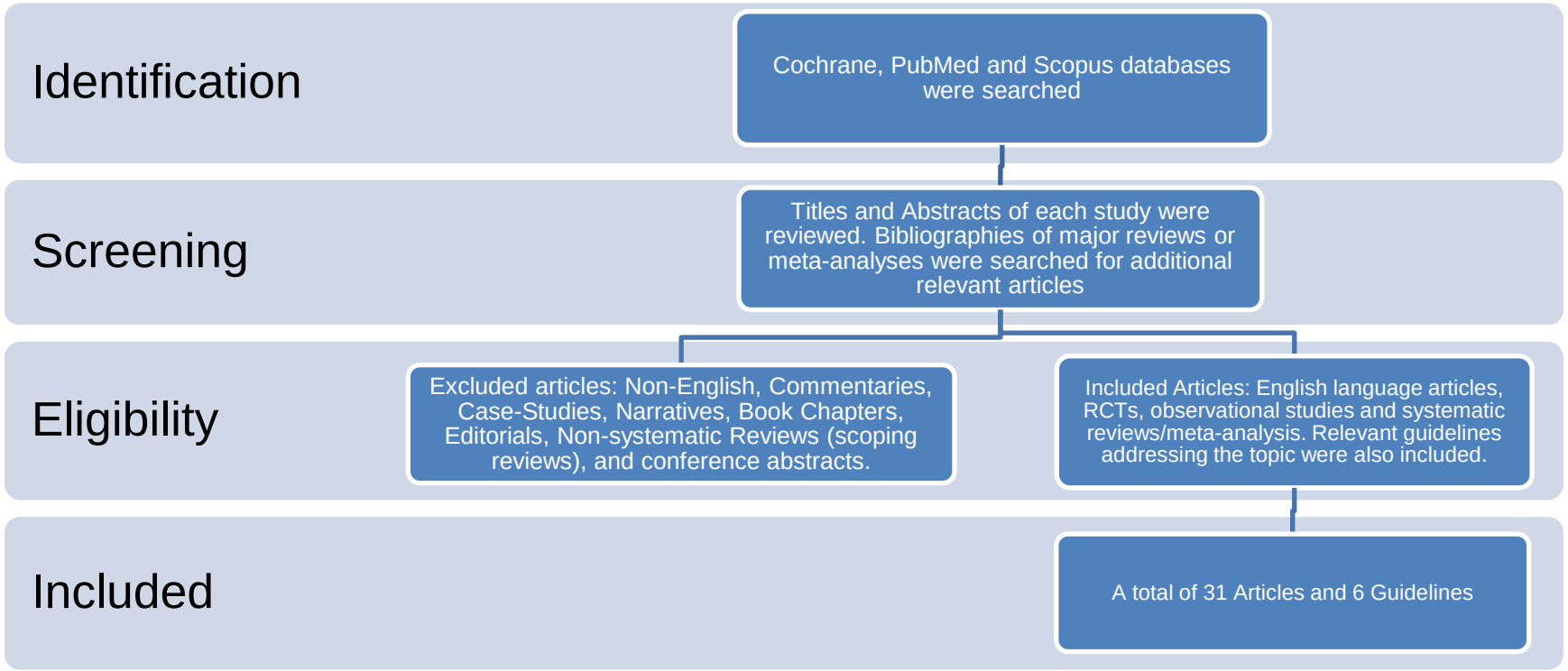
Search Strategy



Cochrane, PubMed and Scopus databases were searched using terms such as Stroke AND (Rehabilitation OR Neurological rehabilitation OR “early mobilization” OR “early rehabilitation” OR” outpatient” OR “home-based rehabilitation” OR “day hospital”). Titles and abstract of each article were reviewed for relevance. Bibliographies were reviewed to find additional relevant articles. Articles were excluded if they were: non-English, commentaries, case-studies, narrative, book chapters, editorials, or conference abstracts. Additional searches for relevant best practice guidelines were completed and included in a separate section of the review. A total of 31 articles and 6 guidelines were included.

Published Guidelines

Guideline	Recommendations
Mead GE, Sposato LA, Silva GS, Yperzeele L, Wu S, Kutlubaev MA et al. **Systematic review and synthesis of global stroke guidelines for the World Stroke Organization.** ***Int J Stroke*. 2023; 18(5):499-531.**	Offer early supported discharge services for those with mild to moderate disability. (Strong recommendation) Commence mobilization within 48 h of stroke onset unless otherwise contraindicated but do not start intensive out-of-bed activities within 24 h of stroke onset. (Strong recommendation)
National Clinical Guideline for Stroke for the UK and Ireland. London: Intercollegiate Stroke Working Party; 2023 May 4. **Available at:** www.strokeguideline.org. **(selected)**	People with motor recovery goals undergoing rehabilitation after a stroke should receive a minimum of 3 hours of multidisciplinary therapy a day (delivered or supervised by a therapist or rehabilitation assistant focused on exercise, motor retraining and/or functional practice), at least 5 days out of 7, to enable the range of required interventions to be delivered at an effective dose. – Rehabilitation programmes should be individualised to account for comorbidities, baseline activity levels, post-stroke fatigue, tolerance, goals and preferences. Therapy can be paced throughout the day, to accumulate at least 3 hours of motor/functional therapy; – For people unable to tolerate 3 hours of therapy a day, the barriers to doing so should be fully assessed and actively managed with strategies to ensure they are able to participate in therapy and be active as far as possible; – People undergoing rehabilitation after a stroke should be supported to remain active for up to 6 hours a day (including therapist-delivered therapy), for example through the use of open gyms, self-practice, carer-assisted practice, engaging in activities of daily living, and activities promoting cardiovascular fitness. [2023] Services delivering rehabilitation for people after stroke should: – deliver a range of individualised one-to-one therapies, structured semi-supervised practice and group work (including rehabilitation gym sessions and a range of exercise and activity groups relevant to the person's needs); – have access to adequate rehabilitation space such as a gym and areas for functional practice (e.g. kitchen and bathroom), appropriate space to accommodate group work, and quiet space for psychological assessment and sensitive discussions; – ensure that delivery of rehabilitation intensity includes education for both the person with stroke and their family/carers to better understand their difficulties, and their recovery and rehabilitation; – be organised to encourage and support people with stroke to remain active outside of therapist-delivered sessions. [2023] In the first two weeks after stroke, therapy targeted at the recovery of mobility should consist of frequent, short interventions every day, typically beginning between 24 and 48 hours after stroke onset. [2016] Multidisciplinary stroke teams should incorporate the practice of functional skills gained in therapy into the person's daily routine in a consistent manner, and the care environment should support people with stroke to practise their activities as much as possible. Functional activities should be individualised to the person's goals and interests. [2023] Healthcare staff who support people with stroke to practise their activities should do so under the guidance of a qualified

Guideline	Recommendations
	therapist. [2016]
Zhang T, Zhao J, Li X, et al. **Chinese Stroke Association guidelines for clinical management of cerebrovascular disorders: executive summary and 2019 update of clinical management of stroke rehabilitation.** ***Stroke and Vascular Stroke Vasc Neurol.* 2020 Sep;5(3):250-259.**	4. Patients who had a stroke should rehabilitate as soon as possible when clinically stable (vital signs stable, symptoms and signs no longer progress) through the step-by-step training method (Grade I recommendation, Level A evidence). 5. Mobilisation within 24hours after stroke onset is not recommended because it may reduce the possibility for a good outcome at 3 months (Grade III recommendation, Level B evidence). 6. It is reasonable for patients who had a mild and moderate stroke to do bedside rehabilitation and early rehabilitation away from bed 24hours after stroke onset. Rehabilitation should be conducted in a step-by-step manner, under supervision if necessary (Grade IIa recommendation, Level A evidence). 7. The intensity of rehabilitation should be individualised, and the patient's physical strength, endurance and cardiopulmonary function should be taken into account. The rehabilitation is reasonable to last at least 45min per day if possible at the early stage, after which it is beneficial to appropriately increase the intensity (Grade IIa recommendation, Level B evidence).
Powers WJ, Rabinstein AA, Ackerson T, Adeoye OM, Bambakidis NC, Becker et al; on behalf of the American Heart Association Stroke Council. **2018 Guidelines for the early management of patients with acute ischemic stroke: a guideline for healthcare professionals from the American Heart Association/American Stroke Association.** ***Stroke.* 2018; Mar;49(3):e46-e110**	**4.11. Rehabilitation** 2.It is recommended that stroke survivors receive rehabilitation at an intensity commensurate with anticipated benefit and tolerance. Class I; LOE B-NR. 3.High-dose, very early mobilization within 24 hours of stroke onset should not be performed because it can reduce the odds of a favorable outcome at 3 months. Class III: Harm: LOE B-R.
Clinical Guidelines for Stroke Management 2017. Melbourne (Australia): National Stroke Foundation.	**Amount and Intensity of Rehabilitation:** For stroke survivors, rehabilitation should be structured to provide as much scheduled therapy (occupational therapy and physiotherapy) as possible. Strong recommendation For stroke survivors, group circuit class therapy should be used to increase scheduled therapy time. Strong recommendation A minimum of three hours a day of scheduled therapy (occupational therapy and physiotherapy) is recommended, ensuring at least two hours of active task practice occurs during this time. Weak recommendation **Timing of Rehabilitation:** For stroke patients, starting intensive out-of-bed activities within 24 hours of stroke onset is not recommended. Strong

Guideline	Recommendations
	recommendation All stroke patients should commence mobilisation (out-of-bed activity) within 48 hours of stroke onset unless otherwise contraindicated (e.g. receiving end-of-life care). Strong recommendation For patients with mild and moderate stroke, frequent, short sessions of out-of-bed activity should be provided, but the optimal timing within the 48-hour post-stroke time period is unclear. Weak recommendation
Winstein CJ, Stein J, Arena R, Bates B, Cherney LR, Cramer SC et al; on behalf of the American Heart Association Stroke Council, Council on Cardiovascular and Stroke Nursing, Council on Clinical Cardiology, and Council on Quality of Care and Outcomes Research. **Guidelines for adult stroke rehabilitation and recovery: a guideline for healthcare professionals from the American Heart Association/American Stroke Association.** ***Stroke* 2016;47:e98–e169**	It is recommended that early rehabilitation for hospitalized stroke patients be provided in environments with organized, interprofessional stroke care. Class 1, Level A It is recommended that stroke survivors receive rehabilitation at an intensity commensurate with anticipated benefit and tolerance. Class 1, Level B High-dose, very early mobilization within 24 hours of stroke onset can reduce the odds of a favorable outcome at 3 months and is not recommended. Class III, Level A

Evidence Tables

Early Initiation of Rehabilitation Therapies

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
Early Mobilization					
Rethnam et al. 2022 **Australia** **Patient-level meta-analysis**	In 2 trials, the risk of bias was low in all 6 domains assessed. In the remaining trials, risk of bias was high or unclear in >1 domain.	6 RCTs including 2,630 participants who had sustained an acute stroke. Mean age was ~70 years, 62% were men. >50% of patients had sustained a mild stroke.	Trials compared out-of-bed mobilization starting within 48 hours from stroke (very early mobilization [VEM]) to usual care. Included trials were AVERT II/III, SEVEL (Herisson et al. 2016), VERIAS (Poletto et al. 2015), and VERITAS (Langhorne et al. 2010). In addition to these trials, which were included in the 2018 Cochrane review, Tong et al. 2019, was also included.	**Primary outcomes:** Favourable outcome (mRS score 0–2) and death at 3 months **Secondary outcomes:** Barthel Index /100 (BI), death at 14 days, LOS, and adverse events.	The median delay to starting mobilization post-stroke onset was 20 hours in the VEM vs. 23 hours in the usual care group. Significantly fewer patients in the VEM group had a favourable outcome at 3 months (48% vs. 52%; adj OR=0.75, 95% CI 0.62–0.92), with no increased risk of death (7% vs. 7%, adj OR=1.46, 95% CI 0.92–2.31). Mean BI scores at 14 days were similar between groups (81 vs. 82). There was no significant difference between groups in the distribution of mRS scores at 90 days. Median LOS was 7 days in both groups. In subgroup analyses of the primary outcomes, there were no interactions identified among all that were assessed (geographic region, sex, age, baseline stroke severity, stroke type [ischemic vs. hemorrhagic], premorbid mRS or time to first mobilization [<24 hours, 24-48 hours >48 hours]).
Langhorne et al. 2018 **UK** **Cochrane review**	3 trials were deemed to be at low risk of bias. The remainder were at high or unclear risk of bias.	9 RCTs (n= 2,958), including participants who had sustained an acute stroke and could be mobilized within 48 hours. Median age was 68 years, 52% were men. Baseline stroke severity was moderate in most trials. A median of 12% had ICH.	Trials that started out-of-bed mobilization within 48 hours of stroke, and aimed to reduce time-to-first mobilization, with or without an increase in the amount or frequency (or both) of mobilization activities (VEM group), were compared with usual care, where time-to-first mobilization was commenced later. Trials included SEVEL,	**Primary outcome:** Death of poor outcome (dependency or institutionalization) at the end of follow up. **Secondary outcomes:** Death, dependency, institutionalization, activities of daily living (ADL), extended ADL,	The median delay to starting mobilization after stroke onset was 18.5 hours in the VEM group and 33.3 hours in the usual care group. The median difference within trials was 12.7 hours. There were no significant differences in the odds of primary outcome at 3 months between groups (51% vs. 49%; OR= 1.08, 95% CI 0.92 to 1.26, p = 0.36), or the odds of death (7% vs. 8.5%; OR=1.27, 95% CI 0.95 to 1.70; p = 0.11).

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			AVERT (phases II and III), Langhorne 2010, Chippala & Sharma 2016, Morreale et al. 2016, Poletto 2015, and AKEMIS et al. 2014	quality of life, walking ability, complications (e.g. deep vein thrombosis), patient mood, and length of hospital stay	Mean 20-point Barthel Index was significantly higher in the VEM group (MD= 1.94, 95% CI 0.75 to 3.13, p = 0.001). Mean length of stay was significantly shorter in the VEM group (MD= -1.44, 95% CI -2.28 to - 0.60, p = 0.0008).
Li et al. 2018 **China** **Systematic review & meta-analysis**	NA	6 RCTs including patients admitted to hospital following acute ischemic or hemorrhagic stroke	Trials compared early mobilization (within 24 hours of stroke) vs. usual care. Trials included SEVEL, AVERT (phases II and III), Chippala & Sharma 2016, and AKEMIS et al. 2014, all described below)	**Primary outcomes:** mRS (0-2), mortality at 3 months **Secondary outcomes:** BI scores at 3 months, LOS	There was no significant difference between groups in the proportion of patients with mRS score of 0-2 at 3 months (RR=0.80, 95% CI 0.58-1.02). The results from 5 trials were included (n=1,646). Early mobilization was not associated with an increased risk of mortality (RR=1.21, 95% CI 0.76-1.75). The results from 4 trials were included. Early mobilization was associated with higher BI scores at 3 months (SMD=0.66, 95% CI 0.0-1.31). The results from 4 trials were included (n=285). Early mobilization was associated with a significantly reduced LOS (WMD=-1.97, 95% CI -2.63 to -1.32). The results from 3 trials were included (n=236).
Chippala & Sharma 2016 **India** **RCT**	CA: ☑ Blinding: Patient:☒ assessor ☑ ITT:☒	86 patients ≥18 years with acute onset of ischemic stroke who were able to react to verbal commands, had SBP 120-180 mm Hg, oxygen saturation >92%, a heart rate of 40-100 bpm and temperature <38.5°C. Mean age was 60 years, 53% were male. 52% of patients had moderately disabling strokes (NIHSS 8-16).	Within 24 hours of stroke onset, patients were randomized 1:1 to either the Very Early Mobilization group or a standard care group for 7 days or until discharge. The treatment protocol for the Early mobilization group was similar to the AVERT protocol. Patients were out of bed within 24 hours and received passive and active mobilization. Patients in the standard care groups received routine stroke unit	**Primary outcome:** Barthel Index (BI) at day 7 and 3 months **Secondary outcomes:** LOS	The were 6 losses to follow-up (3 in each group). Median BI scores at baseline, discharge and 3 months were: 50, 85 and 90 (intervention) and 52.5, 70 and 75 (control). There was significantly greater improvement in median BI scores from admission to discharge (p<0.001) and from admission to 3-months in the intervention group (p<0.001) Median LOS was significantly shorter in the early mobilization group (8 vs. 10, p<0.001).

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			care.		
Herisson et al. 2016 **France** **RCT** ***Stroke and Early VErticaL positioning (SEVEL)***	CA: ☑ Blinding: Patient:☒ assessor ☒ ITT: ☒	167 patients ≥18 years with acute onset of ischemic stroke were recruited from 11 centres. Patients with severe stroke (NIHSS ≥22 were excluded). Mean ages were 68.1 (early group), 71.2 years (progressive group). Mean NIHSS scores were 7.2 (early) and 7.8 (progressive).	Patients were randomized 1:1 to early and progressive sitting arms. Patients in the early sitting arm were seated out of bed as soon as possible, within the first day of stroke. Patients in the progressive group sat in bed for days 1-2 post stroke, and then seating out of bed on day 3. For both protocols, minimal duration of the first sitting was 15 minutes in both groups; maximum duration was 60 minutes. Duration of treatment was 7 days, or until discharge.	**Primary outcome:** Favourable outcome (mRS 0-2) at 3 months **Secondary outcomes:** Medical complications, LOS, tolerance at 7 days and 3 months	The study was terminated early due to slow enrollment. There were 24 losses to follow-up (17 early group, 7 progressive group). The percentage of patients with mRS scores of 0-2 at 3 months was similar (76.2% vs. 77.3%, p=0.52). There were no significant differences between groups on any of the secondary outcomes (medical infections: pulmonary infection, UTI, dysphagia, DVT, pressure ulcer). Mean LOS was 9.8 (early) vs. 10.5 (progressive) days, p=0.27. The procedure was well-tolerated in both groups. There were no significant changes in SBP, DBP or heart rate immediately after the procedure, or 5 minutes later.
Bernhardt et al. 2015, 2016, 2021, Kennedy et al. 2021 **Australia** **RCT** ***A Very Early Rehabilitation Trial for stroke (AVERT)***	CA: ☑ Blinding: Patient:☒ assessor ☑ ITT: ☑	2,104 patients ≥18 years, recruited from 56 stroke units, located in 5 countries, within 24 hours of ischemic or hemorrhagic stroke without pre-morbid disability. Mean age was 72 years, 55% of patients were admitted with mild stroke (NIHSS score 1-7)	Patients were randomized to receive usual care (UC, n=1,050) or very early mobilization (VEM), (n=1,054), a task-specific intervention focused on sitting, standing, and walking activity, initiated within 24 hrs. of stroke onset. Four pre-specified levels of out-of-bed activity were used, depending on functional recovery. The duration of treatment was 14 days, or until discharge from the stroke unit.	**Primary outcome:** Favourable outcome (mRS 0-2) at 3 months **Secondary outcomes:** Shift in distribution of mRS, time to achieve assisted- free walking over 50m, proportion of patients able to walk unassisted at 3 months, death, and serious adverse events	**Main Results (2015)** Significantly fewer patients in the VEM group had a favourable outcome (46% vs. 50%; adjusted OR=0.73, 95% CI 0.59-0.90, p=0.004). There was no significant shift in the distribution of mRS between groups (adjusted OR=0.94, 95% CI 0.85-1.03, p=0.193). Significantly more patients in the VEM group were mobilized within 12 and 24 hrs (23% vs. 14% and 92% vs. 59%, respectively). The median time to first mobilization was significant sooner in the VEM group (18.5 vs. 22.4 hrs, p<0.0001). Patients in the VEM group received significantly more out of bed sessions (median of

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					6.5 vs. 3, p<0.0001) and more daily therapy (31 vs. 10 min, p<0.0001). The odds of walking for 50 m independently were not significantly increased in the VEM group (adjusted OR=1.04, 95% CI 0.94-1.15, p=0.46). The odds of death, non-serious adverse events and neurological serious adverse events were not significantly increased in the VEM group. **Subgroup analysis Bernhardt et al. 2016)** Regardless of group assignment, keeping time to first mobilization and frequency constant, every extra 5 minutes of out-of-bed activity per day reduced the odds of a favorable outcome (OR=0.94, 95% CI 0.91-0.97, p<0.001) and reduced the odds of walking unassisted for 50 m (OR=0.85, 95% CI 0.81-0.89, p<0.001), after controlling for age and stroke severity. Regardless of group assignment, increasing the frequency of out-of-bed sessions improved the odds of favorable outcome by 13% (OR for each additional session =1.13, 95% CI 1.09-1.18, p <0.001) and improved the odds of walking 50 meters unassisted by 66% (OR for each additional session =1.66, 95% CI 1.53–1.80, p< 0.001), after controlling for age and stroke severity. Increased frequency of out-of-bed sessions also reduced the odds of death and fatal and nonfatal neurological serious adverse events. **Early mortality (Bernhardt et al. 2021)** 80 patients (3.8%) died within the first 14 days (VEM 48, UC 32). The most common cause of death was stroke related (stroke progression or recurrence).

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					After adjustment for age and stroke severity, the odds of 14-day mortality were significantly higher in the VEM group (adj OR=1.76, 95% CI 1.06–2.92). **Time to independent ambulation (Kennedy et al. 2021)** The median time to walking 50 metres unassisted was 6 days. 75% of patients achieved independent walking by 3 months. Regardless of group assignment, factors associated with slower return to independent walking were older age (HR= 0.65, 95% CI 0.57 to 0.75), diabetes (HR=0.84, 95% CI 0.74 to 0.95), severe stroke (HR=0.094, 95% CI 0.07 to 0.12), hemorrhagic stroke (HR=0.79, 95% CI 0.68 to 0.93) and right hemisphere stroke (HR=0.80, 95% CI 0.71 to 0.89).
Sundseth et al. 2012 **Norway** **RCT** ***Akerhus Early Mobilization in Stroke Study (AKEMIS)***	CA: ☑ Blinding: Patient ☒ Assessor ☑ ITT: ☑	56 patients admitted to a single stroke unit with ischemic stroke or ICH within 24 hours of onset of symptoms. Mean age was 77 years, 45% male.	Patients were randomized to a very early mobilization (VEM) group (n=32) or to a control group (n=33). Patients in both groups received standard stroke unit care. Patients in the VEM group were mobilized as soon as possible (within 24 hours post stroke). The control group were mobilized between 24 and 48 hours.	**Primary Outcome:** Poor outcome at 3 months (mRS score of 3-6). **Secondary Outcomes:** Independence (BI score of ≥18), death and number of complications at 3 months.	The median time to first mobilization from stroke onset was significantly shorter for patients in the VEM group (13.1 vs. 33.3 hrs, p<0.001). More patients in the VEM group had poorer outcomes compared with control participants, although this difference was not statistically significant (OR= 2.70, 95% CI: 0.78-9.34; p=0.12). The odds of death or dependency, or dependency at 3 months were not significantly reduced in the VEM group (OR= 5.26, 95% CI: 0.84-32.88; p=0.08; OR= 1.25; 95% CI: 0.36-4.34; p=0.73, respectively). The improvement in mean NIHSS scores from baseline to 3 months was significantly greater for patients in the VEM group (7.2-3.9 vs. 7.5-5.5, p=0.02). The proportion of patients with at least 1 complication within 3 months was similar between

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					groups (67% vs. 66%, p=0.93).
Craig et al. 2010 **UK** **Systematic Review & Meta-Analysis**	N/A	103 patients included in the AVERT (n=71) and VERITAS (n=32) trials, who had been admitted to hospital following acute first or recurrent stroke. The baseline characteristics of patients in both trials were similar. Participants with severe pre-stroke disability were excluded from both studies.	Both trials examined interventions to mobilize patients within 24 hours after stroke at frequent intervals. The AVERT study implemented the intervention for 14 days, VERITAS trial lasted 7 days. Both studies compared early mobilization treatment groups (VEM) to a standard care control group (SC).	**Primary Outcome:** Independence at 3 months (mRS of 0-2, and Barthel index [BI] of 18-20). **Secondary Outcomes:** Early complications of immobility and activities of daily living at 3 months (stroke-related, immobility-related, comorbidity-related, or other causes).	In pooled analysis, median time to first mobilization was significantly shorter in VEM group (21 vs. 31 hours, p<0.05). The odds of independence, adjusting for age, baseline NIHSS score and premorbid mRS score, were significantly higher for VEM patients using both mRS and BI criteria (OR= 3.11, 95% CI 1.03-9.33 and OR= 4.41, 95% CI 1.36-14.32, respectively). The risk of experiencing immobility related complications was significantly lower in VEM patients (adjusted OR= 0.20, 95%CI 0.10-0.70).
Earlier Admission to Inpatient Rehabilitation					
Lynch et al. 2014 **Australia** **Systematic review & meta-analysis**	NA	5 RCTs and 38 non-RCTs including patients who had received inpatient rehabilitation following acute stroke.	Data from identified studies were used to answer 2 questions 1) What are the effects of commencing physical rehabilitation within 7 days of stroke? 2) What are the effects of earlier transfer to the rehabilitation service?	**Primary outcomes:** Mortality and good outcome (mRS 0-2), at 3 months	3 RCTs compared mobilization within 24 and 48 hours of admission (n=159). Earlier mobilization was associated with a trend towards higher mortality (OR=2.58, 95% CI 0.98 to 6.79, p=0. 06). There was no significant difference between groups in mean change in BI scores at 3 months (MD=1.20, 95% CI -0.77-3.18, p=0.23), or in the odds of a good outcome (OR=1.16, 95% CI 0.61-2.18, p=0.66). Both outcomes were in the direction of benefit for the usual care group. Pooled analyses were not possible for an examination of rehabilitation initiated within 7 days. Pooled analyses were not possible for Q2, although among 26/32 observational studies, early transfer to rehabilitation was associated with better functional outcome.
Liu et al. 2014 **China** **RCT**	CA: ☑ Blinding: Patient ☒ Assessor ☑	243 patients presenting within 48 hours after first-ever ICH, with no contraindications to being mobilized within 48	Patients were randomized 1:1 to a standard care or very early rehabilitation (VER) groups. Patients in both groups underwent similar	**Primary outcome:** Death within 6 months of stroke **Secondary outcomes:**	Mean LOS was significantly shorter for patients in the VER group (24 vs. 34 days, p<0.001). There were significantly more deaths at 6 months in the standard care group (3 vs. 12). Patients in

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
	ITT: ☑	hours of stroke onset and a Fugl–Meyer stroke deficit score of 27-90. Mean age was 59 years, 56% were men.	rehabilitation, which was performed by the patient's relatives under the guidance of medical staff and included ADL and stretching exercises, and neuromuscular electric stimulation and repetitive task-specific training. Rehabilitation was initiated at one-week post stroke for patients in the standard care group and within 48 hours of stroke onset in the VER group.	SF-36, BI and Zung Self-Rated Anxiety Scale, assessed at 3- and 6-months post stroke	the VER group were more likely to be alive (HR= 4.44, 95% CI 1.24–15.87). There were no significant differences between groups in any of the secondary outcomes at 3 months, but significant differences favouring the VER group at 6 months. Mean Physical Component Summary SF-36 scores 43.8 vs. 37.4, p<0.05; mean BI scores were 73.8 vs. 61.3, p<0.05; and mean Zung scores were 48.9 vs. 55.2, p<0.05.
Wang et al. 2011 **USA** **Retrospective Study**	N/A	1,908 patients admitted to a regional inpatient rehabilitation hospital with moderate or severely disabling stroke. Mean age was 63.6 years, 45.7% were women.	Patients were classified by Case Mix Group (CMG) as moderately impaired (CMG=0104- 0107, n=614), and severely impaired (CMG=0108-0114, n=1,294). All patients received a minimum of 3 hours of therapy/day. The association between time from stroke onset to rehabilitation admission and FIM gain, controlling for demographics, co-morbid conditions, and other measures (eg, pre-IRH setting, IRH length of stay), was examined. Separate analyses were performed for moderate and severe stroke groups	**Primary Outcomes:** FIM change from inpatient rehabilitation admission to discharge	Mean time to admission to inpatient rehabilitation was 27.3 days. Patients with moderate disability were admitted significantly sooner (19.8 vs. 30.9 days). Mean admission and discharge FIM scores were 52.2 and 77.4, respectively, and were significantly lower for patients with severe disability. **Patients with moderate stroke severity**: Decreasing time (days) to inpatient rehabilitation admission was a significant predictor of total FIM gain and motor FIM gain (p<0.0001), but not cognition FIM gain (p=0.2328). **Patients with severe stroke severity**: Decreasing time (days) to inpatient rehabilitation admission was a significant predictor of total FIM gain, motor FIM gain, and cognition FIM gain (p<0.0001). Significant predictors of FIM gain for both groups were decreasing age, decreasing time to rehabilitation, previous stroke (none), and lower admission FIM scores.

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
					Ideal time from stroke onset to admission to rehabilitation for patients with moderate stroke severity was within 21 days, and 30 days for patients with a severe stroke.

Intensity of Rehabilitation Therapy Provision

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
MacDonald et al. 2024a **Canada** **Retrospective study**	NA	12,770 adult patients admitted for inpatient stroke rehabilitation in the province of Ontario (January 2017 to December 2021). Mean age was 72.6 years, 54% were men. Mean admission FIM was 71.5. Mean acute care LOS was 29.5 days	The association between rehabilitation intensity (RI), defined as the minutes per day of direct therapy by SLP, OT and PT services for each patient divided by rehabilitation LOS) and FIM change (and other secondary outcomes) was examined, controlling for age, sex, Charleson Comorbidity Index, income quintile, living alone prior to admission, preadmission living setting, rural, treatment on a stroke unit, acute care LOS (days), total rehabilitation admission FIM, and rehabilitation institution.	**Primary outcome:** FIM change from admission to discharge **Secondary outcomes:** Discharge back to preadmission setting, discharge to LTC, time spent at home in the first 90days after stroke, rehabilitation effectiveness (discharge FIM−admission FIM)/(126−admission FIM) ×100%) and motor and cognitive FIM change	Mean RI (minutes/day) across 4 quintiles was 38.2, 62.7, 81.8 and 114.5. There was a significant trend between RI quartiles and FIM change between the quartiles:21.5 (Q1), 25.9 (Q2), 28.9 (Q3) and 31.5 (Q4), p<0.0001 for trend. FIM change decreased incrementally at an RI point beyond 95 minutes/day. There was a significant trend toward better performance on all secondary outcomes except the proportion of patients discharged to home vs. assisted living vs. residential care vs. other.
ACTRN 12619000557134 Bernhardt et al. 2023 **Australia**	CA: ☑ Blinding: Patient ☒ Assessor ☑	Patients aged ≥18 years admitted to an acute stroke unit within 48 hours of ischemic stroke. Planned recruitment is 1,300 patients with mild	Patients were randomized to receive prespecified mobility training regimens (functional task-specific), provided by physiotherapists/nurses until discharge or 14 days.	**Primary outcome:** Favourable outcome (mRS score 0-2) at 3 months **Secondary outcomes:**	TBA

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
RCT protocol ***AVERT DOSE***	ITT: ☑	stroke (NIHSS<7) and 1,400 patients with moderate stroke (NIHSS 8–16) from 50 centres in 7 countries.	Interventions replace usual mobility training.	Deaths at 3 months, complications during the intervention period, recovery of unassisted walking, and quality of life at 3months	
Clark et al. 2021 **UK** **Cochrane review**	In 2 trials, there was no risk of bias in all 6/6 domains assessed. In all the other trials, the risk of bias was uncertain or high in ≥1 of the domains assessed.	21 RCTs including 1,412 participants recovering from stroke. In 16 trials, participants received therapy within 6 months of stroke onset, while in 5 trials, persons were included > 6 months post stroke. Participants received rehabilitation in inpatient (n=14), outpatient, (n=2) or community (n=3) settings	Trials compared different amounts of the same type of OT and/or PT. In 15 trials, different amounts of therapy provided per day were compared. In these trials, the median difference per day between control and intervention groups was 30 minutes. Two trials compared groups that received a different number of days per week of rehabilitation. Two trials compared more minutes of rehabilitation over more days with fewer minutes over fewer days. One study compared different durations of rehabilitation. 13 trials provided upper limb rehabilitation, 5 provided general rehabilitation therapy, and 3 provided mobilization/ lower limb training. Minutes of therapy provided per week ranged from 90 to 1288, days per week ranged from 3 to 7. Duration of rehabilitation provided ranged from 2 weeks to 6 months.	**Primary outcome:** ADL **Secondary outcomes:** Activity measures of upper and lower limbs, motor impairment measures of upper and lower limbs, and serious adverse events (SAE)/death	The difference in total time between control and intervention groups ranged from 186 to 6,160 minutes (median difference was 840 minutes). *More time vs. less time spent in rehabilitation (assessed immediately after the intervention)* In 19 trials which provided more time in rehabilitation therapies, there was no significant improvement in ADL performance (SMD=0.13, 95% CI -0.02 to 0.28). GRADE: very low Greater therapy time was not associated with significantly greater improvements in activity measures of the upper or lower limb (SMD=0.09, 95% CI -0.11 to 0.29, 18 trials and SMD=0.25, 95% CI -0.03 to 0.53; 5 trials, respectively). GRADE: low and very low, but was associated with modest improvements in upper and lower motor impairment (SMD=0.32, 95% CI 0.06 to 0.58, 12 trials; and SMD=0.71, 95% CI 0.15 to 1.28, 1 trial) GRADE: Low Greater therapy time was not associated with a significant increase in SAE (RR=1.20, 95% CI 0.51 to 2.85, 2 trials). GRADE: low *More time vs. less time spent in rehabilitation (medium term outcomes)* Greater therapy time was not associated with significantly greater improvements in the primary or secondary outcomes, assessed in one to 12 trials. All outcomes GRADE: very low Long term outcomes were assessed in a single

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
					trial. Greater therapy time was not associated with significantly greater improvements in the primary or the one secondary outcome assessed (lower limb activity). All outcomes GRADE: low Subgroup analyses were performed for time since stroke, hours of therapy provided per week and the type of intervention provided. Subgroup analysis was not performed on differences between sexes.
Klassen et al. 2020 **Canada** **RCT** ***Determining Optimal Post-Stroke Exercise (DOSE)***	CA: ☑ Blinding: Patient ☒ Assessor ☑ ITT: ☒	75 patients recruited from 6 Canadian inpatient rehabilitation units, who were < 10 weeks poststroke with lower extremity hemiparesis, with premorbid mRS score <2 and the ability to ambulate ≥5 meters with up to one person maximum assist and assistive/orthotic device as required. Mean age was 57 years, 59% were men. Mean baseline NIHSS score was 5.	Patients were randomized 1:1:1 to receive one hour of physical therapy, 5x/week (control) or one hour of therapy, 5x/week at twice the intensity of the control group (DOSE-1) or one hour of therapy, 2x/day, 5x/week at quadruple the intensity of the control group (DOSE-2), for 4 weeks.	**Primary outcome:** 6-minute walk test (6MWT) **Secondary outcomes:** 5-metre walk test, Berg Balance Scale (BBS), Patient Health Questionnaire-9 (PHQ-9) and EQ-5D-5-L Index	At the end of the intervention, when controlling for baseline 6MWT, patients in both DOSE-1 and DOSE-2 groups had significantly greater improvements in the primary outcome compared with the control group (mean difference=61 m, and 58 m, respectively). At the end of the intervention, patients in the DOSE-2 group had achieved significantly greater improvements in walking speed (5 m walk test), compared with the control group, while patients in both DOSE groups had significantly greater improvements in the EQ-5D-5 L Index compared with the control group. For analysis of the 6- and 12-month outcomes, the data from the two DOSE groups were collapsed into a single group. At the end of both the 6- and 12-month follow-up, there were no significant time x group interactions for the primary outcome.
Schneider et al. 2016 **Australia** **Systematic review & meta-analysis**	NA	14 studies (954 participants) including samples that were composed of >80% of persons recovering from stroke. Mean age ranged from 49 to 75 years. Time after stroke ranged from a few weeks to > 6	Outcomes of trials comparing additional dose of rehabilitation interventions vs. standard amount of the same rehabilitation interventions, aimed at improving upper or lower activity, or both, were pooled.	**Primary outcome:** Standardized measures of upper and lower extremity activity	The immediate effect of additional rehabilitation (i.e post intervention scores-pre-intervention scores) was significantly improved activity (SMD=0.39, 95% CI 0.07-0.71, p=0.02). Small increases in additional therapy were not associated with significant improvement in activity (SMD=0.0, 95% CI -0.4-0.4, p=0.99. Results from 3 trials included).

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
		months, with 86% of the studies carried out < 6 months after stroke.	Subgroup analyses were carried out examining the degree of the increase of additional therapy: ≤100% of standard dose and >100% of standard dose		Large increases in additional therapy were associated with significant improvements in activity (SMD=0.59, 95% CI 0.23-0.94, p=0.001. Results from 8 trials included). Results from ROC indicated that an increase of ≥240% of standard dose of therapy would be required to ensure true benefit.
Lohse et al. 2014 **Canada** **Systematic review & meta-regression**	NA	30 RCTs including 1,750 patients recovering from stroke participating in trials examining interventions to improve motor outcomes. Time from stroke onset was approximately one year.	Summary effect sizes were calculated to examine the association between duration of therapy received (upper and lower) and stroke outcome, controlling for other factors.	**Primary outcome:** Effect size	Mean time scheduled for therapy was significantly longer in treatment groups compared with control groups (57.4 vs. 24.1 hours, Δ=33.3 hours) Overall, treatment groups receiving more therapy improved beyond control groups that received less (Hedges' *g*=0.35; 95% CI 0.26–0.45). Increased time scheduled for therapy was a significant predictor of increased improvement, after controlling for linear and quadratic effects of time after stroke.
Wang et al. 2013 **USA** **Retrospective study**	N/A	360 patients ≥18 years, admitted to an inpatient rehabilitation unit following a stroke, with a minimum LOS of 3 days. Mean age was 64.8 years, 57.4% were men.	Data related to type and duration of therapies (OT, PT and SLP) were obtained by chart review. The association between therapy duration/day and FIM gain was analyzed. Total therapy time provided per day was analyzed as a continuous and a categorical variable (<3.0 hours vs. ≥3.0 to <3.5 hours vs. ≥3.5 hours).	**Primary outcome**: Gains in FIM (mobility, cognition sub scores and total gain).	Mean total therapy time received per day was 190.3 ±29.3 minutes. Mean LOS was 20.2 days. Mean admission, discharge and FIM gains achieved during rehabilitation were 45.8, 71.7 and 26.0, respectively. The percentage of patients who received varying duration of total therapy per day was: <3 hours 29.4% ≥3.0 to <3.5 hours 46.9% ≥3.5 hours 23.6% Controlling for age, sex, comorbidities, and total baseline motor and cognition scores, patients who received a total therapy time of <3.0 hours per day had significantly lower total FIM gains compared with those treated for ≥3.0 hours per day. No significant difference in total FIM gain was found

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
					between patients treated for ≥3.0 but <3.5 hours and ≥3.5 hours per day. Independent predictors of total FIM gain included hemorrhagic stroke, left brain injury, earlier admission to rehabilitation, a longer rehabilitation stay and longer duration of therapy provision (both ≥3.0 to <3.5 and ≥3.5 hours, compared with <3.0 hours).
The Glasgow Augmented Physiotherapy Study (GAPS) group 2004 **UK** **RCT**	CA: ☑ Blinding: Patient ☒ Assessor ☑ ITT: ☑	70 patients admitted to one of 3 rehabilitation hospitals following stroke which had occurred within the previous 6 weeks. Mean age was 68 years, 41% were women. Mean BI score was 11.0	Patients were randomized 1:1 to receive either conventional inpatient stroke services with provision of physiotherapy input for 30-40 minutes direct contact per day, five days per week, or conventional stroke services plus additional physiotherapy input, aiming to provide double the total daily physiotherapy time to 60-80 minutes per day, five days per week.	**Primary outcome:** Motricity Index (MI) **Secondary outcomes:** Time to achieve mobility milestones, Rivermead Mobility Index, Barthel Index and Nottingham EADL, EuroQoL	Patients in the augmented group received more PT (34 vs. 21 hours). The mean proportion of time spent standing was significantly greater in the augmented group (8.0% vs. 4.8%, p=0.002) There were no significant differences in mean MI scores between groups at baseline, 4 weeks, 3 or 6 months. There were no significant differences between groups in the proportions of patients who achieved a mobility milestone (time to first stand, time to walk 10 paces or time to walk 10 metres). There were no significant differences between groups for any of the secondary outcomes at any of the assessment points.
Horn et al. 2005 **USA** **Prospective study**	N/A	830 patients ≥18 years, with a first-time admission to an inpatient stroke rehabilitation unit, 389 with moderately-sever stroke and 441 with severe stroke. Mean ages were 66.2 years (moderate group) and 67.9 years (severe group).	Data used for this study was from the Post-Stroke Rehabilitation Outcomes Project. The relationship between days from symptom onset to rehabilitation admission, medications, nutritional support, and minutes of PT, OT, and SLP activity per patient per day and discharge	**Primary outcomes**: Discharge FIM scores and discharge destination	Mean admission and discharge FIM scores for moderate group were and 71.6 and 97.7. 93.3% of patients were discharged home Mean admission and discharge FIM scores for severe group were 43.1 and 72.3. 67.1% of patients were discharged home. Mean duration of therapy received per day (minutes) for patients with moderate stroke was 43.5 (PT); 40.9 (OT) and 25.6 (SLP).

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
			total FIM score, was examined, controlling for patent characteristics, stroke symptoms, neurobehavioral impairment, and rehabilitation LOS. Analyses were performed separately for moderate and severe strokes (severity based on case-mix groups (CMGs)). A secondary analysis included patient outcomes according to therapy received during only the first block of rehabilitation (i.e. number of minutes within the first 3-hour session for each of the PT, OT and SLP), to assess the effect of early intensive therapy. Analysis controlled for patient characteristics, symptoms, neurobehavioral impairments and length of stay in inpatient rehabilitation.		**Patients with Moderate Stroke Severity:** The number of minutes a patient spent on various activities (gait, transfers, speech etc.) with PTs, OTs and SLPs had at least one significant association with either increased discharge FIM, increased discharge motor FIM or increased discharge cognitive FIM or some combination of the three. **Patients with Severe Stroke Severity:** Amount of time spent with PTs, OTs, SLPs had similar increases in FIM scores as seen in patients with moderate stroke severity. In the secondary analysis with the regression analysis only including time spent with the patient during the first 3-hour block of therapy provided by the PT, OT or SLP, there were similar findings. Greater FIM scores with decreased time between stroke and admission to rehabilitation and greater FIM scores with increased time spent with patient during the first 3-hour block of therapy provided. Similar findings for patients with both moderate and severe strokes.
Kwakkel et al.1997 **Netherlands** **Systematic Review & meta-analysis**	N/A	9 trials (n=1,051) including patients who had sustained a stroke. Mean age was 66.2 years.	Trials examining the effect of different intensities (enhanced or augmented vs. control or usual care) of PT and/or OT. Duration of treatment ranged from one to 8 months	**Primary outcomes:** Measures of ADL, functional outcome (eg., dexterity, walking performance, and walking velocity) and neuromuscular outcome (eg., muscle strength)	Patients in the intervention groups received more daily PT and OT compared with patients in the control groups (48.4 vs. 23.4 minutes and 44.0 vs. 18.5 minutes, respectively) Greater treatment intensity was associated with significantly higher ADL scores (Hedges' *g*=0.28, 95% CI 0.16-0.41; 9 studies), and better neuromuscular outcomes (Hedges' *g*=0.37, 95% CI 0.13-0.62; 5 studies), but not better functional outcome (Hedges' *g*=0.10, 95% CI -0.10 to 0.30, 4 studies).
Sex Differences in Intensity of Therapy and Rehabilitation outcomes					

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
MacDonald et al. 2024b **Canada** **Retrospective study**	NA	12,770 patients admitted for inpatient rehabilitation post stroke between September 1, 2012 and August 31, 2017 in Ontario. Mean age was 72.6 years. Mean baseline FIM score was 71.5.	Differences in therapy provision between men (n=6,893, 54%) and women (n=5,877, 46%), were compared, adjusting for treatment on an acute stroke unit at any time during inpatient stay, Charlson co-morbidity index, rural residence, pre-admission living setting, living alone pre stroke, income quintile, acute LOS, and total admission FIM.	**Primary outcome:** Rehabilitation intensity (RI) defined as minutes/ per day of direct therapy provided to a patient/ rehabilitation LOS	Mean total LOS was 29.50 days, with no significant difference between men and women. Mean admission FIM score was significantly higher for men (72.77 vs. 69.91, p<0.0001). Mean daily provision of therapy was 75.86 min/day for men vs. 73.33 min/day for women. Mean RI was significantly higher for men (29.76 vs. 29.69, p<0.0001). Adjusting for baseline differences, the mean differences in rehab therapies (minutes/day) by age categories were <60 years 3.34, 95% CI 1.33 to 5.35; 60-79 years 1.37, 95% CI 0.21 to 2.53 and >80 years 1.15, 95% CI -0.23 to 2.53, all in the direction of more therapy for men.
MacDonald et al. 2022 **Canada** **Retrospective study**	NA	20,143 patients admitted for inpatient rehabilitation post stroke between 2017 and 2021 in Ontario.	Differences in the primary outcomes between men (n=10,684) and women (n=9,459), were compared, adjusted for age, rural residence, income quintile, Charlson Comorbidity Index, a history of atrial fibrillation, treatment with tissue plasminogen activator, treatment and LOS on a stroke unit, pre-stroke living setting, service interruptions, readmission to acute care and admission FIM.	**Primary outcome:** Total discharge FIM, rehab LOS and discharge home	Mean (unadjusted) total discharge FIM score was significantly higher in men (97.8 vs. 94.1, p<0.001). There was no significant difference in mean (unadjusted) LOS (men 31.7 days vs. women 31.8). A significantly higher percentage of men were discharged home (82.9% vs. 81.1%, p=0.001). In adjusted analysis, discharge FIM score was no longer significantly lower than men's (β= -.20, 95% CI -0.64 to 0.25). In adjusted analysis, women had a significantly shorter rehab LOS (relative change in mean LOS= 0.98, 95% CI 0.96–0.99). In adjusted analysis, women were more likely to be discharged home (OR=1.14, 95% CI 1.05–1.24). The authors concluded that sex did not impact the

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
					outcomes of interest in this study.

Repetitive Task-Specific Therapy

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
French et al. 2016 **UK** **Cochrane Review**	NA	33 RCTs (1,853 participants), which included individuals ≥18 years recovering from a stroke. In 14 trials, only patients who had sustained a first-ever stroke were included, in 6 trials, patients with either a first or recurrent stroke were included. In 10 trials, the mean age was <60 years, and in 7 trials, the mean age was >70 years. Mean time since stroke was within one month (n=10 trials), 1-3 months in 5 trials and ≥3 months in the remaining trials.	Trials evaluated studies in which an intervention of any intensity or duration included an active motor sequence, which was performed repetitively within a single training session, and where the practice was aimed towards a clear functional goal. The control condition varied across trials. Usual care provided in 18 trials. In 11 trials, an attention control was used. The intervention was delivered exclusively during inpatient rehabilitation in 11 trials and in both inpatient and outpatient settings in 3 trials. 16 trials provided 10- 21 total hours of training; 4 trials provided 30-40 hours and 4 trials provided ≥40 hours.	**Primary Outcomes:** Arm function, hand function, change in walking distance, walking speed, functional ambulation, and lower-limb functional measures, assessed at the end of the treatment period **Secondary outcomes:** ADL and global motor function	Repetitive task training was associated with small, but significantly greater improvements in arm function (SMD=0.25, 95% CI 0.01-0.49; results from 11 trials), hand function (SMD= 0.25, 95% CI 0.00- 0.51; results from 8 trials) and sitting balance or reach (SMD=0.28, 95% CI 0.01-0.55; results from 6 trials). Repetitive task training was associated with significantly greater distance walked in 6 minutes (MD=34.80 m, 95% CI 18.19- 51.41; results from 9 trials), significantly higher functional ambulation scores (SMD= 0.35, 95% CI 0.04-0.66; results from 8 trials), significantly higher measures of lower-limb function (SMD= 0.29, 95% CI 0.10- 0.48; results from 5 trials) and significantly higher measures of global motor function (SMD=0.38, 95% CI 0.11-0.65; results from 5 trials). Repetitive task training was associated with significantly higher measures of ADL (SMD=0.28, 95% CI 0.10-0.45; results from 9 trials). Effects were not modified by intervention type, dosage of task practice or time since stroke for upper or lower limb outcomes, but treatments delivered within 6 months of stroke onset were more effective.

Stroke Survivor's Perspectives on Post–Acute Rehabilitation Options, Goals, Satisfaction, and Transition to Home

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
Krishnan et al. 2019 **USA** **Qualitative study**	NA	18 patients discharged from inpatient rehabilitation programs (n=12) or skilled nursing homes (n=6) following admission for stroke. Most patients were recruited from support groups. Mean age was 68 years, 78% were men. Time since stroke ranged from 1-10 years.	Semi structured interviews were conducted by 3 of the study's authors to examine patient's involvement in planning for their rehabilitation stay, goal setting, and discharge needs. Interviews lasted approximately 30 minutes.	**Primary Outcomes:** Major and minor themes	**Major themes** *Involvement in selecting post-acute care (PAC) setting* 11 patients reported someone else was involved in selecting PAC setting (i.e., the patient was omitted from the process).4 patients were involved in selecting the PAC setting. *Patient involvement in rehabilitation goal setting* 8 patients were involved in goal setting, 8 patients were not. *Patient Discharge Information Needs* 9 patients expressed a need for information around discharge **Minor themes** *Patient satisfaction with rehabilitation* 13 patients expressed satisfaction with the rehabilitation experience. *Recommendations to Peers* 14 patients gave recommendations to peers, based on their experience on topics such as diet and lifestyle.

Person-Centred Goal Setting in Persons with Cognitive or Communication Difficulties

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
Dörfler & Kulnik **UK** **Qualitative study**	NA	11 stroke rehabilitation professionals (8 women, 3 men) including 5 OTs, 1 physiotherapist, 2 psychologists and 3 SLPs. Years working in	Semi-structured interviews were conducted to explore strategies used to involve stroke survivors with communication and/or	**Primary Outcomes:** Themes	5 themes emerged: Flexibility: to guide the process of person-centred goal-setting participants emphasized the need to be flexible, not rigid. Trusting relationships: participants placed an

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
		the field ranged from 3 to 30.	cognitive impairment in person-centred goal setting.		emphasis on developing a trusting relationship with the client Enabling empowerment: Participants strived to create an environment in which clients could make their own decisions, thereby enabling autonomy Techniques for one-to-one interaction: participants described specific techniques, which they applied in one-to-one interaction with clients Involving relatives: When communication or cognitive impairments were too severe, all participants tended to invite relatives (next of kin) to participate in the goal-setting process.

Shared Decision Making (SDM) within Goal Setting

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
Rose et al. 2016 **UK** **Systematic review**	No qualitative study was considered fatally flawed, using the 13-item version of COREQ.	15 studies (5 quantitative studies, 9 qualitative and 1 mixed methods) including adult rehabilitation patients.	Thematic data synthesis of studies which considered the SDM approach within the goal-setting process	**Primary Outcomes:** Themes	Theme 1. *Approaches and methods of SDM within goal setting in current practice* How goals were set and the level of patient involvement within goal setting varied amongst the literature. Overall, only 3 studies reported a goal-setting process with clear evidence for SDM. Theme 2. *Staff views on using SDM within goal setting* In all but one study, clinicians could see the benefits of using SDM within goal setting. Theme 3. *Patients' views on SDM within goal setting* In 4 studies, patients were interviewed to explore their views on their involvement within goal setting and responses identified both values and

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
					difficulties. Patients reported that they enjoyed goal setting with clinicians, stating that they felt a sense of ownership of them and personal control over their treatment. Theme 4. *Perceived benefits of the use of SDM within goal setting* In all studies, participants reported seeing the benefits of goal setting (compared to staff setting goals), with the most common benefit reported as an increase in the patient's motivation. Theme 5. *Barriers and facilitators to using SDM within goalsetting* One of the most reported barriers from the literature was lack of knowledge by patients and therapists. The use of decision support within goal setting was identified as a facilitator reported in 4 studies. Theme 6. *How can the goal-setting process be improved to involve patients more*? The most commonly reported improvement was to introduce an education element prior to goal setting.

Patient-Centred Goal Setting in an Outpatient Stroke Rehabilitation Setting

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
Rice et al. 2017 **Canada** **Retrospective study**	NA	286 patients who received outpatient stroke rehabilitation between January 2010 and December 2013. Patients with aphasia were excluded. Mean age was 63 years, 58% were men. Mean FIM	At the intake appointment, prior to the commencement of therapy, patients were asked to identify their goals (maximum of 10) and to rate their current satisfaction with their ability to perform each	**Primary Outcomes:** Goal satisfaction scores	Patients set an average of 3 goals. Examples of goals themes were improved mobility, hand function, cognition, balance, and strength, and to improve ADLs. Most of the 1st listed goals were impairment based (64.7%), using the ICF classification system, followed by activity limitations (28.7%) and

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
		admission score was 110.8. Mean time since stroke was 6 months.	goal (Goal Satisfaction Score [GSS]) on an 11-point scale from 0 (not satisfied) to 10 (most satisfied). At the patient's discharge appointment, they re-rated their satisfaction for having met their goal to determine if progress had been made.		participation (6.6%). For patients' first-listed goals, their mean GSS scores improved significantly between admission and discharge. Patients who set impairment-based goals rated their GSS significantly higher than both activity-based and participation-based goals at admission and discharge. Patients with activity-based goals rated their GSS significantly higher than participation-based goals. There was significant improvement in patient satisfaction scores on discharge for their 2nd listed and 3rd -listed goals.

Abbreviations

ADL: Activities of Daily living	CA: Concealed allocation	CI: Confidence interval
FIM: Functional Independence Measure	HR: hazard ratio	ITT: Intention-to-treat analysis
LOS: Length of stay	MD: mean difference	mRS: modified Rankin Scale
NA: Not assessed	NIHSS: National Institutes of Stroke Scale	OR: Odds ratio
OT: Physical therapy	PT: physical therapy	SLP: Sleep-language pathology
SMD: standardized mean difference	WMD: weighted mean difference	

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