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

Stroke Rehabilitation Unit Care

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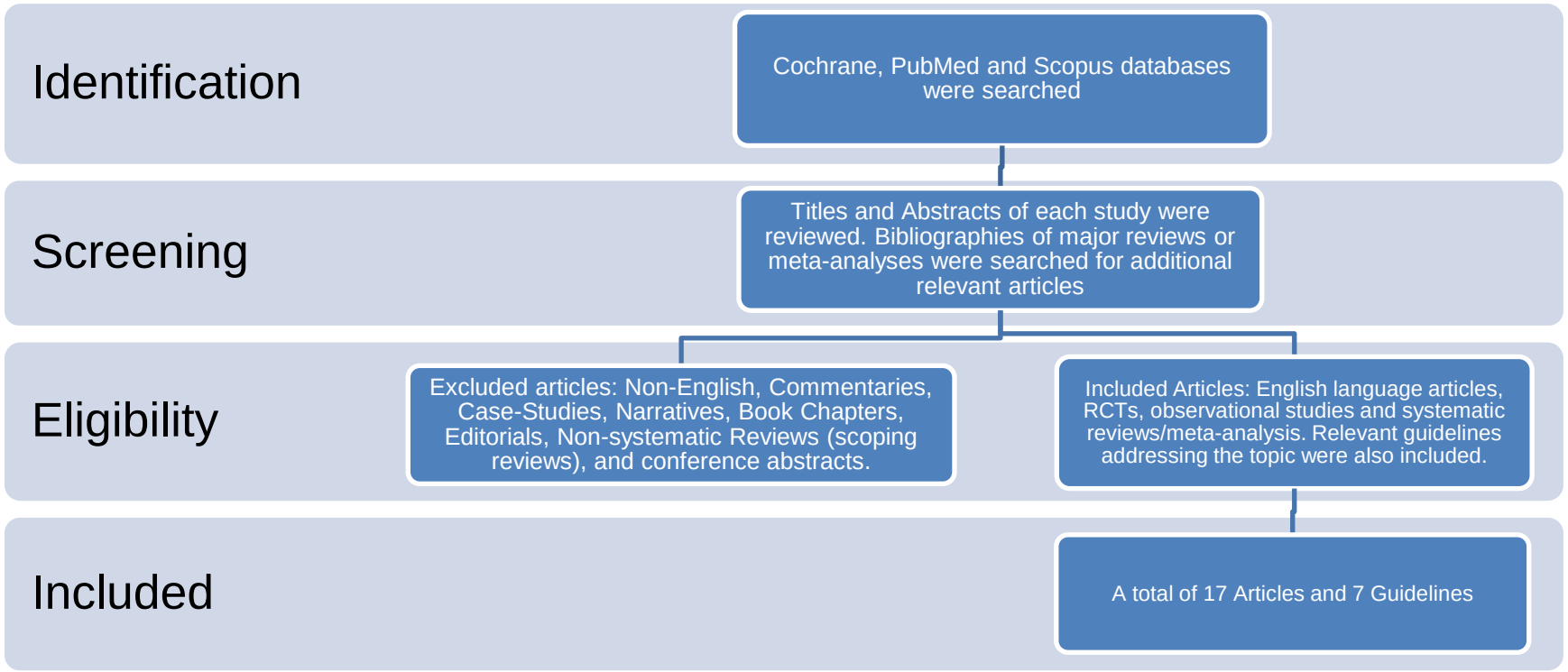
Table of Contents

Search Strategy



Cochrane, PubMed, and Scopus databases were searched using terms such as Stroke AND (rehabilitation OR therapy OR intervention) AND (unit OR ward OR interprofessional OR interdisciplinary OR organized OR coordinated OR specialized team). 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, non-systematic review, or conference abstracts. Additional searches for relevant best practice guidelines were completed and included in a separate section of the review. A total of 17 articles and 7 guidelines were included and were separated into separate categories designed to answer specific questions.

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 Jun;18(5):499-531.**	Stroke patients should be treated on a specialized, geographically defined stroke rehabilitation unit, with coordinated care, staffed by an interdisciplinary rehabilitation team (physicians, nurses, physiotherapists, occupational therapists, speech-language therapists, and social workers and dieticians) with expertise/training in stroke rehabilitation, recovery, and return to work (Stroke recommendation)
Management of Stroke Rehabilitation Working Group. VA/DoD clinical practice guideline for the management of stroke rehabilitation. Washington (DC): Veterans Health Administration, Department of Defense; Version 5.0 – 2024. **Available at:** https://www.healthquality.va.gov/guidelines/Rehab/stroke/	We suggest using case management services at time of discharge from the acute care hospital or post-acute care facility to improve activities of daily living and functional independence. Weak (for)
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 stroke should be treated in a specialist stroke unit throughout their hospital stay unless their stroke is not the predominant clinical problem. A stroke rehabilitation unit should have a single multidisciplinary team including specialists in: – medicine; – nursing; – physiotherapy; – occupational therapy; – speech and language therapy; – dietetics; – clinical psychology/neuropsychology; – social work; – orthoptics; with timely access to rehabilitation medicine, specialist pharmacy, orthotics, specialist seating, assistive technology and information, advice and support (including life after stroke services) for people with stroke and their family/carers. A stroke rehabilitation unit should have access to a consultant specialising in stroke rehabilitation (medical or non-medical, i.e. nurse or therapist, where professional regulation permits) at least 5 days a week, with twice weekly consultant-led ward rounds. Stroke rehabilitation units with non-medical consultant leadership should have daily medical cover (ward doctors, GPs), enabling admissions and discharges 7 days a week, with support available from stroke physicians as required. 24-hour on-site medical cover may not be required depending on patient admission criteria, with adequate out of hours arrangements.

Guideline	Recommendations
Zhang T, Zhao J, Li X, Bai Y, Wang B, Qu Y et al. **Chinese Stroke Association guidelines for clinical management of cerebrovascular disorders: executive summary and 2019 update of clinical management of stroke rehabilitation.** ***Stroke Vasc Neurol.* 2020 Sep;5(3):250-259. (selected)**	1. It is recommended that patients with acute stroke are admitted to a Stroke Unit of the General Hospital. These patients should immediately undergo a comprehensive assessment, while early rehabilitation should be provided by the rehabilitation team when patients reach stability (Grade I recommendation, Level A evidence).
Powers WJ, Rabinstein AA, Ackerson T, Adeoye OM, Bambakidis NC, Becker K 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**	4.1 Stroke Units 1. The use of comprehensive specialized stroke care (stroke units) that incorporates rehabilitation is recommended. Class I; LOE A
Clinical Guidelines for Stroke Management 2017. Melbourne (Australia): National Stroke Foundation.	• All stroke patients should be admitted to hospital and be treated in a stroke unit with an interdisciplinary team (strong recommendation) Practice points • All stroke patients should be admitted directly to a stroke unit (preferably within three hours of stroke onset). • For patients with suspected stroke presenting to non-stroke unit hospitals, transfer protocols should be developed and used to guide urgent transfers to the nearest stroke unit hospital. • Where transfer is not feasible, smaller isolated hospitals should manage stroke services in a manner that adheres as closely as possible to the criteria for stroke unit care. Where possible, stroke patients should receive care in geographically discrete units.
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	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

Guideline	Recommendations
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**	tolerance. Class I; Leve B

Evidence Table

Stroke Unit Care

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
Systematic reviews and meta-analyses					
Stroke Unit Trialists' Collaboration (SUTC) 2020 **UK** **Cochrane Review**	The domain with a high risk of bias was blinding of the outcome assessor (n=12 trials).	29 RCTs includings 5,902 participants with a confirmed diagnosis of stroke. Quasi RCTs were not included in this update.	Organized stroke unit care was compared with alternative, less organized levels of service. Core features of more organized forms of care included multidisciplinary staffing and co-ordinated multidisciplinary team care, incorporating meetings at least once per week. Less organized forms of care included general medical wards, mobile stroke teams or mixed rehabilitation wards. A network meta-analysis (NMA) was also conducted using general ward as the base comparator.	**Primary Outcomes:** Poor outcome (mRS 3-6 at the end of follow-up or the need for institutional care) **Secondary Outcomes:** Death, death or institutional care, death or dependency, quality of life, patient and carer satisfaction, and length of hospital stay (LOS)	*i) Stroke unit care vs. alternative care* After a median of 12 months of follow-up, the odds of a poor outcome (mRS 3-6 or need for institutionalization) were significantly lower with stroke unit care (OR=0.77, 95% CI 0.69 to 0.87; 26 trials). GRADE: moderate. After a median of 12 months of follow-up, stroke unit care was associated with significantly reduced odds of death (OR=0.76, 95% CI 0.66 to 0.88; 29 trials). GRADE: moderate. At the end of follow-up, the odds of death or institutional care were significantly reduced in the stroke unit care group (OR=0.76, 95% CI 0.67 to 0.85; 25 trials). GRADE: moderate. At the end of follow-up, the odds of death or dependency were significantly lower in the stroke unit care group (OR=0.75, 95% CI 0.66-0.85; 24 trials). GRADE: moderate. Stroke unit care was not associated with a significantly longer LOS (SMD -0.17, 95% CI -0.33 to 0.01;19 trials). GRADE: low. *ii) Stroke ward vs. general ward* After a median of 12 months of follow-up, the odds of a poor outcome were significantly lower with stroke unit care (OR=0.78, 95% CI 0.68 to 0.91; 14 trials). GRADE: moderate. After a median of 12 months of follow-up, stroke unit care was associated with significantly reduced odds

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
					of death (OR=0.75, 95% CI 0.63 to 0.91; 15 trials). GRADE: moderate. At the end of follow-up, the odds of death or institutional care were significantly reduced in the stroke unit care group (OR=0.74, 95% CI 0.63 to 0.87; 13 trials). GRADE: moderate. At the end of follow-up, the odds of death or dependency were significantly lower in the stroke unit care group (OR=0.75, 95% CI 0.64-0.88; 12 trials). GRADE: moderate. Stroke unit care was not associated with a significantly longer LOS (SMD -0.13, 95% CI -0.29 to 0.04;10 trials). GRADE: low. *iii) Mobile stroke team vs. general medical ward* A mobile stroke team was not associated with significantly better outcome for any of the outcomes of interest, based on data from 2 trials. *iv) Mixed rehabilitation ward versus general medical ward* After a median of 12 months of follow-up, the odds of a poor outcome (mRS 3-6 or need for institutionalization) were significantly lower with a mixed rehab ward (OR=0.65, 95% CI 0.58 to 1.42; 6 trials). Quality of the evidence was low. After a median of 12 months of follow-up, a mixed rehab ward was not associated with significantly reduced odds of death (OR=0.91, 95% CI 0.63 to 0.91; 6 trials). Quality of the evidence was low. At the end of follow-up, the odds of death or institutional care were significantly reduced in a mixed rehab ward (OR=0.71, 95% CI 0.51 to 0.99; 5

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
					trials). Quality of the evidence was low. At the end of follow-up, the odds of death or dependency were significantly lower in the mixed rehab ward group (OR=0.65, 95% CI 0.47-0.90; 6 trials). Quality of the evidence was low. Mixed rehab was not associated with a significantly longer LOS (SMD -0.08, 95% CI -0.21 to 0.37; 3 trials). Quality of the evidence was low. Benefits of stroke unit care were independent of sex, age stroke type and severity. In the NMA, compared with a general ward, the odds of a poor outcome were reduced significantly for a stroke ward (OR=0.74, 95% CI 0.62-0.89), and mixed rehab ward (OR=0.70, 95% CI 0.52-0.95), but not compared with a mobile stroke team (OR=0.88, 95% CI 0.58-1.34). For the outcome of death at the end of scheduled follow-up, only a stroke ward was associated with a significant reduction (OR=0.62, 95% CI 0.47-0.82).
Sun et al. 2013 **Belgium**	NA	7 RCTs and 3 controlled trials, which included patients with stroke or 'stroke-like' symptoms who were admitted to hospital within 7 days of symptoms onset, were included. Mean ages ranged from 62-80 years. The proportion of women varied from 39-66%.	The outcomes of patients admitted to acute stroke units (SU), defined as "a geographic location within the hospital designated for stroke or stroke-like patients, staffed by a multidisciplinary team with a special interest and expertise in stroke care", were compared with patients admitted to any less-organized forms of care, including internal medicine, neurology, cardiology, or geriatric wards. Units that provided post-acute rehabilitation only, were	**Primary outcome:** Mortality at end of follow-up **Secondary outcomes:** independence, institutionalization	The odds of mortality associated with SU case were of borderline significance (OR=0.84, 0.70-1.00, p=0.05). Duration of follow-up ranged from 6 months to 10 years. The results from 8 trials were included. SU care was associated with increased odds of independence (OR=1.23, 95% CI 1.04 to 1.45); decreased odds of death or institutional care (OR=0.70, 95% CI 0.60 to 0.83), institutional care (OR=0.61, 95% CI 0.47 to 0.79), and death or dependency (OR=0.81, 95% CI 0.69 to 0.96).

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
			excluded.		
Foley et al. 2007 **Canada**	N/A	14 RCTs and quasi-RCTs including participants with a diagnosis of stroke. Studies in which the intervention was provided to a mixed population (stroke and non-stroke) or outside of a discrete physical unit (e.g., mobile units) were excluded.	Trials compared stroke unit care to conventional care and were organized into one of 3 groups depending on the model of care provided: 1) Acute care (randomization within 36 hours of stroke onset and less than 2-week length of stay); 2) Combined (acute and rehabilitation); 3) Rehabilitation (admitted within 2 weeks of stroke onset following transfer from another facility).	**Primary Outcomes:** Mortality, death or dependency, and length of hospital stay (LOS)	Stroke unit care vs. alternative care **Mortality:** Acute Care: OR=0.80, 95% CI 0.61–1.03 Combined: OR=0.71, 95% CI 0.54–0.94 Rehabilitation: OR=0.60, 95% CI 0.44–0.81 Overall: OR=0.71, 95% CI 0.60–0.83 **Death/Dependency:** Acute Care: OR=0.70, 95% CI 0.56–0.86 Combined: OR=0.50, 95% CI 0.39–0.65 Rehabilitation: OR=0.63, 95% CI 0.48–0.83 Overall: OR=0.62, 95% CI 0.53–0.71 **LOS (days):** Acute Care: WMD=12.9, 95% CI -10.0–4.3 Combined: WMD=-14.4, 95% CI -27.1–-1.7 Rehabilitation: WMD=-13.2, 95% CI -48.3–21.9 Overall: WMD=-9.9, 95% CI -16.6–-3.1
Seenan et al. 2007 **UK**	N/A	25 observational studies (n=42,236) including participants with a clinical diagnosis of a stroke. In studies that included a mixed sample, ≥80% of persons had to have sustained a stroke.	The outcomes of patients treated on a stroke unit were compared to those treated in non-stroke units.	**Primary Outcome:** 12-month mortality **Secondary Outcome:** Poor outcome (death, discharge location other than home, dependence in daily activities)	Stroke unit care was associated with significantly better outcomes Death: OR=0.79, 95% CI 0.73–0.86, p<0.001. Results from 17 trials included. Death (multi-centered trials only): OR=0.82, 95% CI 0.77–0.87, p<0.001. Results from 8 trials included. Poor outcome: OR=0.87, 95% CI 0.80–0.95, p<0.01. Results from 15 trials included.
Clinical Trials					
Juby et al. 1996 **Lincoln et al. 2000; Drummond et al. 2005 (long-term follow-up)** **UK**	CA: ☒ Blinding: Patient ☒ Assessor☑ ITT: ☒	315 stroke patients who were candidates for inpatient rehabilitation. Patients who were unconscious at admission, had other medical problems requiring treatment during acute care, or	Participants were randomized to receive inpatient rehabilitation on a stroke unit (n=176) or a general medical or geriatric unit (n=139).	**Outcomes:** Barthel Index (BI), Rivermead Motor Assessment and ADL Scale, Nottingham Extended ADL, General Health Questionnaire GHQ), Cognitive and Instrumental	Stroke unit care was associated with significantly longer mean LOS (81±41.7 vs. 63.2±46.9 days, p<0.01). 12-month mortality did not differ significantly between the two groups (OR=0.72, 95% CI 0.39–1.31, p>0.05). At both 3 and 6 months, participants treated in the

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
RCT		were expected to be discharge within 2 weeks were excluded. 18% of those assessed met inclusion criteria.		Readjustment Scale, and non-specified mood rating scales	stroke unit were more independent in ADLs and extended ADLs (BI, Rivermead ADL Scale, and the Nottingham Extended ADL Scale), ($p<0.05$); however, at 12 months, only mean Nottingham Extended ADL Scale scores differed significantly between groups, favouring stroke units ($p<0.05$). There were no significant differences between groups at 3, 6, or 12 months in mean Rivermead Motor Assessment or any of the mood and adjustment measures, with the exception that patients treated in the SU reported significantly better scores on the GHQ at the 12-month follow-up ($p<0.05$). Loses to follow-up (3, 6, 12-month follow-up): Stroke Unit = 10.2%, 14.8%, 18.2% Conventional Unit = 15.8%, 21.6%, 30.2% **5-year follow-up (Lincoln et al. 2000)** Data from 87% of randomized patients were available. Fewer patients treated in the stroke unit had died (45% vs. 55%, RR=0.80, 95% CI 0.65–1.01) while a greater percentage were disabled (34% vs. 27%) or institutionalized (12% vs. 8%), Survival analyses significantly favoured stroke unit care (log rank test=4.36, $p<0.05$). The risk of death/dependency was significantly lower in the stroke unit group (RR=0.91, 95% CI 0.83–0.99). The relative risk of death/institutionalization associated with stroke unit care was 0.90 (95% CI 0.75–1.08). **10-year follow-up (Drummond et al. 2005)** Data from 87% of randomized patients were available

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
					Significantly fewer patients treated in the stroke unit had died (69% vs. 80%; RR=0.87, 95% CI 0.78-0.97) while a greater percentage were disabled (67% vs. 43%) or institutionalized (20% vs. 10%). Survival analyses significantly favoured stroke unit care (log rank test=6.63, p<0.05). The risk of death/dependency was not significantly lower in the stroke unit care group (RR=0.99, 95% CI 0.94–1.05). The relative risk (RR) of death/Institutionalization was 0.91, 95% CI 0.83–1.00. RRs were calculated assuming worst case scenario for those who could not be traced (SU=8, CW=7) or refused to participate (SU=4, CW=4).
Kalra et al. 1993 **UK** **RCT**	CA: ☒ Blinding: Patient ☒ Assessor☒ ITT: ☒	245 patients, 2-weeks post stroke onset, following acute care treatment in a general medical ward. Patients discharged from acute care within 2-weeks of onset were excluded.	Participants were stratified into 3 groups based on their stroke severity using the Orpington Prognostic Scale: 1) mild-moderate (Prognostic score=<3), 2) moderate-severe (Prognostic score=3-5), and 3) severe-very severe (Prognostic score=>5) and then randomized to a stroke rehabilitation unit (n=126) or a general medical unit (n=126).	**Primary outcomes:** In-hospital mortality, discharge home, discharge to long-term care, and length of hospital stay, Barthel Index.	Among patients with the best prognoses, no significant differences were found between those treated on a stroke unit vs. a general medical unit. Among patients group with moderate-severe stroke severity, those treated in the stroke unit were significantly more likely to be discharged home (75% vs. 52%, p<0.001), less likely to be discharged to long-term care (22% vs. 44%, p<0.001), and experienced a greater median change in Barthel Index score (12 vs. 8, p<0.05) during a shorter length of stay (48.7±17.2 vs. 104.6±28.6, p<0.001), compared to those treated in the general medical ward; however, no differences were found with respect to mortality (3% vs. 4%, p>0.05). Among patients with the worst prognoses, those treated on the stroke unit had significantly lower mortality (37% vs. 67%, p<0.05) and a significantly shorter length of stay (52.3±19.8 vs. 123.2±48.2 days, p<0.001), compared to those treated in the general medical ward; however, no significant differences were found with respect to discharge destination or change in Barthel Index score (both at p>0.05).

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
Observational studies					
Turner et al. 2015 **UK** **Scottish Stroke Care Audit**	NA	41,692 patients admitted to 36 hospitals from 2005-2011 with index stroke events, who survived for at least 3 days, were included. Mean age was 73.4 years, 48.4% were women. 86% were ischemic stroke. 70% of patients were admitted within a day of symptom onset.	The outcomes of patients admitted to stroke units (SU, 79%) were compared with patients admitted to general medical wards (21%), using national registry data. Analyses were adjusted for age in years at time of admission, living alone, independent in activities of daily living, able to lift both arms at first assessment, able to talk, and able to walk	**Primary outcome:** Survival **Secondary outcomes:** Discharge destination	The adjusted odds of survival were significantly higher for patients admitted to a SU at 7, 30, 60,90 and 365 days, ranging from OR of 3.11 (95% CI 2.71 to 3.56) at day 7, to 1.43 (95% CI 1.34 to 1.54) at day 365. The adjusted odds for being discharged home/usual place of residence at 6 months for those admitted to SU were significantly higher (OR=1.19, 95% CI 1.11 to 1.28)
Tamm et al. 2014 **Canada** **Retrospective Study**	N/A	805 patients admitted to 2 community hospitals from 2003 to 2009 with a diagnosis of stroke. Patients were treated on general medical wards by an internist. A 10-bed stroke unit, providing both acute and rehabilitation services, provided by a multidisciplinary team that included stroke neurologists, was established at one of the hospitals in 2007.	At the hospital that established the stroke unit, the outcomes of patients treated from 2007-2009 were compared with those of patients treated before its implementation (2003-2006). At the control hospital, the outcomes of patients treated from 2007-2009 were compared with those of patients treated from 2003-2006, during which time there were no changes in the model of service provision.	**Primary Outcomes:** Mortality, LOS, Discharge disposition	At the hospital that established a stroke unit, there was a significant reduction in mortality after its implementation (8.3% vs. 17.1%, p<0.001, adjusted OR= 0.54; 95% CI 0.31–0.95; p=0.035), a significant reduction in median LOS (8 vs.12 days, p=0.027) and a significant increase in the number of patients discharged home (43.8% vs. 25.7%, p<0.001). Stroke unit care was also associated with fewer cases of pneumonia (10.2% vs. 5.3%, p=0.037). There were no significant differences in any of the outcomes at the control hospital between 2003-2006 and 2007-2009.
Foley et al. 2013 **Canada** **Retrospective Study**	N/A	6,709 patients identified from a national database, who were admitted for inpatient rehabilitation at 57 facilities in the province of Ontario, from 2006-2008.	Two types of service delivery models were identified: a Stroke Rehabilitation Units (SRU), based on the presence of a collection of geographically distinct, stroke-dedicated beds and dedicated therapists (n=1,725, 25.7%), and non-dedicated SRUs	**Primary Outcomes:** LOS, FIM gain, FIM efficiency (FIM gain/LOS), Discharge Home	Patients admitted to a SRU took significantly longer to arrive from acute care (37.2 vs. 22.8 days, p< 0·001) and were admitted with higher mean FIM scores (77.5 vs. 74.8, p<0.001). Mean LOS was significantly longer for SRU patients (42.1 vs. 35.4 days, p<0.001). There was no significant difference between groups

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
			(Non-SRU (n=4,984, 74.3%).		in mean FIM gain (SRU: 22.3 vs. non-SRU: 22.1 days, p=0.748). Mean FIM efficiency was significantly higher in non-SRUs (0.88 vs. 0.62, p<0.001) Persons admitted to a SRU were no more likely to be discharged home (70.5% vs. 68.8%, p=0.21).
Di Carlo et al. 2011 **Italy** ***European Registers of Stroke (EROS) Project***	N/A	355 consecutively admitted patients with a first-ever stroke were included. Patients with subarachnoid hemorrhage were excluded. Mean age was 7.3 years, 54.1% were men. 44% of patients had a baseline Barthel Index score of 0-9	Patients were admitted to either an acute stroke unit (n=140) or to a general medical ward (n=215) at the same institution, according to bed availability. Stroke unit care was provided in an 8-bed, semi-intensive, multidisciplinary care unit. Patients admitted to the general medical ward were referred for physiotherapy or Speech-Language Pathology services, as required.	**Primary Outcomes**: Frequency of investigations and treatments, death, death/dependency and death/institutionalization.	Patients admitted to the general ward were significantly older (mean age 77.2 vs. 67.7 years, p<0.001) and had higher mean NIHSS scores (10.3 vs. 9.7). MRI, carotid duplex scan, and transcranial Doppler were performed significantly more often in SU patients (all p values < 0.001). A significantly higher proportion of SU patients were treated with thrombolysis (18.6% vs. 0.5%, p<0.001). At discharge, SU patients were more likely to be referred to a rehabilitation hospital (38.6% vs. 21.3%, p=0.001). Adjusted for age, sex, baseline risk factors, pre-stroke dependency, acute-phase severity, pathological type, and clinical syndromes, SU care was associated with lower odds of: death at one year (OR=0.4, 95% CI 0.19–0.87), death or dependency at 3 months and one year (OR=0.31, 95% CI 0.14–0.71 and OR=0.45, 95% CI 0.21–0.97) and death or institutionalization at 3 months and one year (OR=0.25 ,95% CI 0.11–0.58 and OR= 0.36, 95% CI 0.17–0.77, respectively).
Terent et al. 2009 **Sweden Riks-Stroke,**	NA	105,043 patients admitted to 86 hospitals following acute stroke from 2001-2005. Mean age was 76 years, 51%	The outcomes of patients admitted to an acute stroke unit (SU 76%) were compared with those admitted to other units or wards (24%), based	**Primary outcomes:** Death or institutional living, death or dependency after 3 months and death	**Death at the end of follow-up (mean of 2.4 years):** SU care was associated with a significantly reduced risk of mortality across all age groups (18-64 yrs, 65-74 yrs, 75-84 yrs and ≥85 yrs), both sexes, all

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
(Swedish Stroke Register)		were men. 20.6% of patients were discharged for additional rehabilitation.	on subgroups, including age, sex, stroke type and level of consciousness (LOC) at admission.	during follow-up period	stroke sub types (ischemic, hemorrhagic and unspecified) and LOC on admission (conscious, unconscious and reduced consciousness). **Death or institutionalization at 3 months:** SU care was associated with significantly reduced odds of the outcome across all age categories, both sexes, and LOCs, and among patients with ischemic or hemorrhagic strokes. **Death or dependency at 3 months:** SU care was associated with significantly reduced odds of the outcome among the youngest and oldest age cohorts, among both sexes, in patients with hemorrhagic stroke and in patients with reduced LOC or who were unconscious at admission.

Effectiveness of Music-based Therapy for Stroke Rehabilitation

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
Mercier et al. 2023 **Canada** **Mixed methods**	NA	44 patients (19 with stroke) admitted to acute neurologic units at one hospital who had attended at least one music therapy (MT) session. Mean age was 59 years, 27% were women.	The MT program included individual therapy sessions provided for 10-90 minutes, group sessions (45 minutes weekly), and co-treatment sessions provided by occupational therapy, physiotherapy, or SLP. In addition, 35 participants (14 patients, 5 family members and 16 health care professionals participated in individual semi-structured interviews or focus groups.	**Primary outcome:** Pain and mood, rated on a visual analogue scale (0-10) after one MT session, assessed before and after the session **Secondary outcome:** Satisfaction with the session	There was significant improvement in mood ($p < 0.001$) and decrease in pain ($p < 0.05$) from pre to-post MT. 74% of patients reported being “very satisfied” with the session. In qualitative analysis, the overarching theme of the study was “benefits of MT.” Subthemes representing the various perceived benefits of MT included: (1) emotional regulation, (2) pain management; (3) effects on self-concept; (4) enjoyment; and (5) social connectedness
Ghai & Ghai 2019 **Germany** **Systematic review & meta-analysis**	Median PEDro score was 5.5	38 trials (11 RCTs and 27 controlled trials) including 968 patients with stroke. Mean ages of most patients ranged from 50-70 years. Most trials included M>F. Most trials included patients in the chronic stage of stroke.	Trials examined music-based auditory cueing in addition to conventional physical therapy. Several trials used treadmill training. Pooled analyses are reported as weighted Hedges’ *g*	**Primary outcomes:** Gait velocity, Stride length, Cadence, Timed Up and Go (TUG) test	RAS was associated with significantly faster gait velocity (*g*=0.68, 95% CI 0.42 to 0.93; 25 trials included), increased stride length (*g*=0.50, 95% CI 0.26 to 0.73; 20 trials included), improved cadence (*g*=0.86, 95% CI 0.50 to 1.22; 23 trials included) and improvement in TUG (g= -0.76, 95% CI -1.36 to −0.16; 6 trials included). Gait and balance training with auditory cueing for 20–45 minutes session, for 3–5 times a week provided maximum improvement.
Särkämö 2018 **Finland** **Review**	NA	Not applicable	Narrative review of the emotional and social impact of musical activities during healthy aging and in neurological diseases (stroke and dementia)	**Primary Outcomes:** Not applicable	The results of an RCT conducted by the author, and 2 small non RCTs are described, demonstrating the benefits of music therapy for improving the recovery of cognition (verbal memory and focused attention), language, reducing depression and confusion and increasing positive mood, relaxation, and motor activity, post stroke. The results of 3 RCTS are described, in which the benefits of music-supported training (MST) are discussed. MST is a form of therapy whereby patients train by playing keyboard and drum pads.

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
					Improvements in fine and gross motor skills and movement parameters of the hemiparetic upper extremity were noted as well as improved mood, post stroke. The benefits of music therapy for aphasic patients (verbal expression) using melodic intonation therapy (MIT), were also discussed, as were the benefits of group-based music therapy.

Abbreviations

ADL: Activities of Daily living	CA: Concealed allocation	CI: Confidence interval
FIM: Functional Independence Measure	ITT: Intention-to-treat	LOS: Length of stay
NA: Not assessed	OR: Odds ratio	RCT: randomized controlled trial
RR: relative risk		

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