CANADIAN STROKE BEST PRACTICE RECOMMENDATIONS

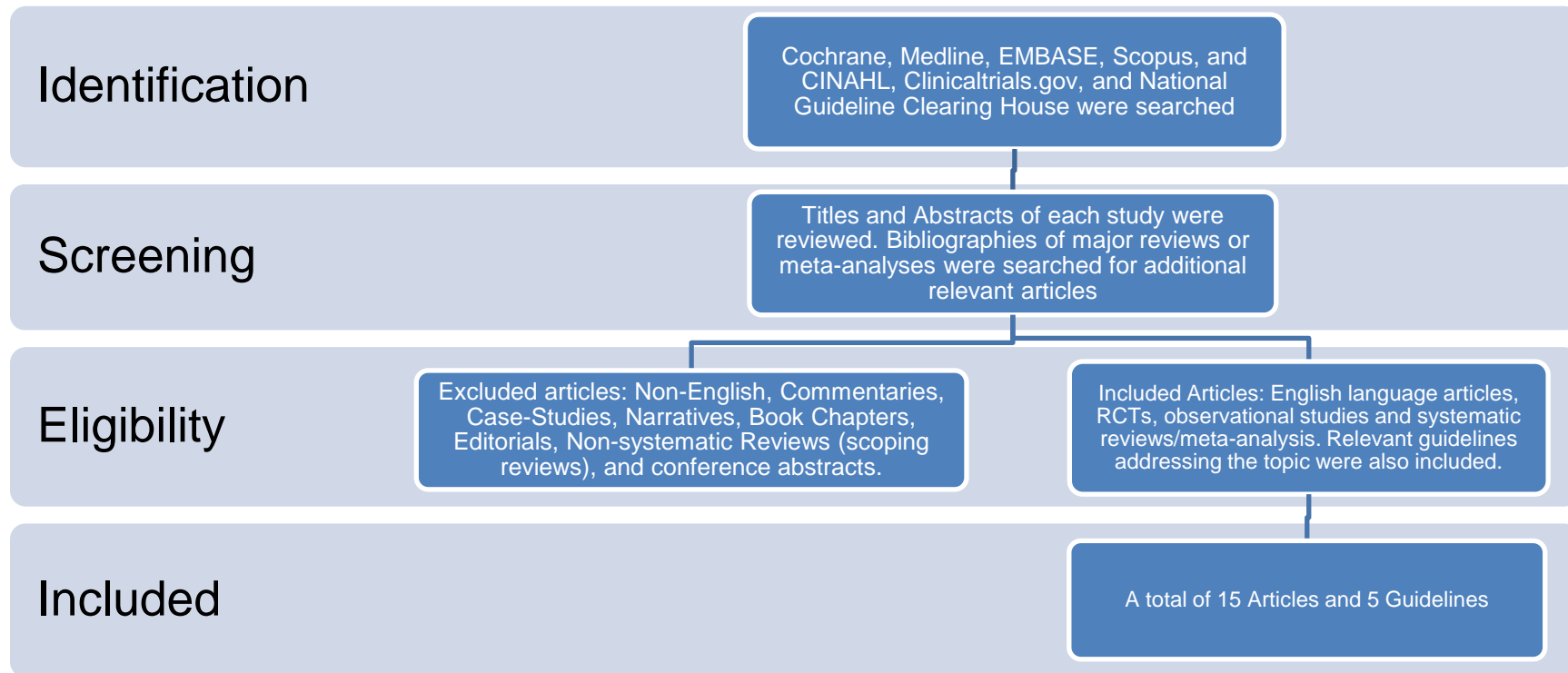## Stroke Rehabilitation Evidence Tables
Stroke Rehabilitation Unit Care

Hebert, D, Teasell, R (Writing Group Chairs)
on Behalf of the Canadian Stroke Best Practice Recommendations
STROKE REHABILITATION Writing Group

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Search Strategy

Identification	Cochrane, Medline, EMBASE, Scopus, and CINAHL, Clinicaltrials.gov, and National Guideline Clearing House were searched
Screening	Titles and Abstracts of each study were reviewed. Bibliographies of major reviews or meta-analyses were searched for additional relevant articles
Eligibility	Excluded articles: Non-English, Commentaries, Case-Studies, Narratives, Book Chapters, Editorials, Non-systematic Reviews (scoping reviews), and conference abstracts. — Included Articles: English language articles, RCTs, observational studies and systematic reviews/meta-analysis. Relevant guidelines addressing the topic were also included.
Included	A total of 15 Articles and 5 Guidelines

Cochrane, Medline, Embase, Scopus, CINAHL, and clinicaltrials.gov were searched using the keywords: Stroke AND (rehabilitation OR therapy OR intervention) AND (unit OR ward OR interprofessional OR interdisciplinary OR organized OR coordinated OR specialized OR team). The same databases were searched to identify paediatric related evidence using additional keywords: "(pediatric OR pediatrics OR paediatric OR paediatrics OR youth OR child OR children OR young)". 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 15 articles and 5 guidelines were included and were separated into separate categories designed to answer specific questions.

Published Guidelines

Guideline	Recommendations
Scottish Intercollegiate Guidelines Network (SIGN). Management of patients with stroke: rehabilitation, prevention and management of complications, and discharge planning. A national clinical guideline. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network (SIGN); 2010 June.	• Stroke patients requiring admission to hospital should be admitted to a stroke unit staffed by a coordinated multidisciplinary team with a special interest in stroke care [A]. • In exceptional circumstances, when admission to a stroke unit is not possible, rehabilitation should be provided in a generic rehabilitation ward on an individual basis [B]. • The core multidisciplinary team should include appropriate levels of nursing, medical, physiotherapy, occupational therapy, speech and language therapy, and social work staff [B]. • Patients and carers should have an early active involvement in the rehabilitation Process [B]. • Stroke unit teams should conduct at least one formal multidisciplinary meeting per week at which patient problems are identified, rehabilitation goals set, progress monitored and discharge is planned [B]. • Members of the multidisciplinary stroke team should undertake a continuing programme of specialist training and education [B]. • Stroke inpatients should be treated 24 hours a day by nurses specialising in stroke and based in a stroke unit [B].
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; 2010. p.p.70-72	• Strongly recommend that patients with mild to moderate disability in need of rehabilitation services have access to a setting with a coordinated and organized rehabilitation care team that is experienced in providing stroke services. [A] • Post-acute stroke care should be delivered in a setting where rehabilitation care is formally coordinated and organized. • If an organized rehabilitation team is not available in the facility, patients with moderate or severe disability should be offered a referral to a facility with such a team. Alternately, a physician or rehabilitation specialist with some experience in stroke should be involved in the patient's care. • Post-acute stroke care should be delivered by a variety of treatment disciplines which are experienced in providing post-stroke care, to ensure consistency and reduce the risk of complications. • The multidisciplinary team may consist of a physician, nurse, physical therapist, occupational therapist, kinesiotherapist, speech and language pathologist, psychologist, recreational therapist, social worker, patient, and family/caregivers. • Inconclusive evidence to recommend the superiority of one type of rehabilitation setting over another. • Patients and/or their family members should be educated in order to make informed decisions and become good advocates. • The rehabilitation program should be guided by specific goals developed in consensus with the patient, family, and rehabilitation team. • Document the detailed treatment plan in the patient's record to provide integrated rehabilitation care.
Clinical Guidelines for Stroke Management 2010. Melbourne (Australia): National Stroke Foundation; 2010 Sep. p. 81-82; 97-98.	• All people with stroke should be admitted to hospital and be treated in a stroke unit with a multidisciplinary team [Grade A]. • All people with stroke should be admitted directly to a stroke unit (preferably within three hours of stroke onset [Grade C]. • Smaller hospitals should consider stroke services that adhere as closely as possible to the criteria for stroke unit care. Where possible, patients should receive care on geographically discrete units [Grade B]. • If people with suspected stroke present to non-stroke unit hospitals, transfer protocols should be developed and used to guide urgent transfers to the nearest stroke unit hospital [Grade C].

Guideline	Recommendations
	• Patients should be transferred to a stroke rehabilitation unit if ongoing inpatient rehabilitation is required [Grade B] • If a stroke rehabilitation unit is not available, patients who require ongoing inpatient rehabilitation should be transferred to a conventional rehabilitation unit where staff have stroke-specific expertise [Grade B]. • All patients, including those with severe stroke, who are not receiving palliative care should be assessed by the specialist rehabilitation team prior to discharge from hospital regarding their suitability for ongoing rehabilitation [Grade GPP]. • The multidisciplinary stroke team should meet regularly (at least weekly) to discuss assessment of new patients, review patient management and goals, and plan for discharge [Grade C].

Duncan PW, Zorowitz R, Bates B, Choi JY, Glasberg JJ, Graham GD, Katz RC, Lamberty K, Reker D. Management of adult stroke rehabilitation care: a clinical practice guideline. Stroke, 2005;36:e117 -125	• Better clinical outcomes are achieved when post-acute stroke patients who are candidates for rehabilitation receive coordinated, multidisciplinary evaluation and intervention.
	  • Post-acute stroke care should be delivered in a setting in which rehabilitation care is formally coordinated and organized.
	  • Post-acute stroke care should be delivered by a variety of treatment disciplines, experienced in providing poststroke care, to ensure consistency and reduce the risk of complications.
	  • The multidisciplinary team may consist of a physician, nurse, physical therapist, occupational therapist, kinesiotherapist, speech and language pathologist (SLP), psychologist, recreational therapist, patient, and family/caregivers.
	• If an organized rehabilitation team is not available in the facility, patients with moderate or severe symptoms should be offered a referral to a facility with such a team, or a physician or rehabilitation specialist with some experience in stroke should be involved in the patient's care.
	• Recommend that a multidisciplinary assessment, using a standard procedure, be undertaken and documented for all patients. Patients with need of rehabilitation intervention should be referred to a specialist stroke rehabilitation team, as soon as possible.
	• Strongly recommend that patients in need of rehabilitation services have access to a setting with a coordinated and organized rehabilitation care team that is experienced in providing stroke services. The coordination and organization of inpatient post–acute stroke care will improve patient outcome.
	• Strongly recommend that rehabilitation services be provided in an environment with organized and coordinated post–acute stroke rehabilitation care.

Stroke Rehabilitation. Long-term rehabilitation after stroke. Issued: June 2013. National Institute for Health and Care Excellence.	**Stroke units**
	1.1.1 People with disability after stroke should receive rehabilitation in a dedicated stroke inpatient unit and subsequently from a specialist stroke team within the community.
	1.1.2 An inpatient stroke rehabilitation service should consist of the following:
	• a dedicated stroke rehabilitation environment
	• a core multidisciplinary team (see recommendation 1.1.3) who have the knowledge, skills and behaviours to work in partnership with people with stroke and their families and carers to manage the changes experienced as a result of a stroke
	• access to other services that may be needed, for example:
	  - continence advice
	  - dietetics
	  - electronic aids (for example, remote controls for doors, lights and heating,
	  - and communication aids)
	  - liaison psychiatry
	  - orthoptics

Guideline	Recommendations

	orthotics
	   - pharmacy
	   - podiatry
	   - wheelchair services
	   • a multidisciplinary education programme.
	The core multidisciplinary stroke team
	1.1.3 A core multidisciplinary stroke rehabilitation team should comprise the following professionals with expertise in stroke rehabilitation:
	   • consultant physicians
	   • nurses
	   • physiotherapists
	   • occupational therapists
	   • speech and language therapists
	   • clinical psychologists
	   • rehabilitation assistants
	   • social workers.
	1.1.4 Throughout the care pathway, the roles and responsibilities of the core multidisciplinary stroke rehabilitation team should be clearly documented and communicated to the person and their family or carer.
	1.1.5 Members of the core multidisciplinary stroke team should screen the person with stroke for a range of impairments and disabilities, in order to inform and direct further assessment and treatment.

Evidence Table

Stroke Rehabilitation Unit Care

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
Stroke Unit Trialists' Collaboration 2013 **Systematic Review and Meta-Analysis (Cochrane Review)**	N/A	28 RCTs and quasi-randomized trials (5,855 participants). Inclusion criteria: patients with a diagnosis of stroke.	Comparing organized stroke unit care with an alternative, less organized service. Heterogeneity was assessed using the I^2 statistic. Analyses used fixed effects models except where important heterogeneity was observed, in which case random effects models were employed.	Primary Outcomes: Death, dependency, and institutionalization. Secondary Outcomes: Quality of life, patient and carer satisfaction, and length of hospital stay.	Death 1) 6 - 52 week follow-up: OR of 0.76 (95% CI 0.66 to 0.88; p=0.0001). 28 trials. 2) 5 - yr follow-up: 0.74 (95% CI 0.59 to 0.94; p=0.01). 3 trials. 3) 10 - yr follow-up: 0.67 (95% CI 0.43 to 1.03; p=0.07). 3 trials. Death/institutional care: 1) 6 - 52 week follow-up: OR 0.76, (95% CI 0.67 to 0.86; p=0.0001). 23 trials. 2) 5 - yr follow-up: 0.59 (95% CI 0.33 to 1.05; p=0.07). 3 trials. 3) 10 - yr follow-up: 0.57 (95% CI 0.37 to 0.88; p=0.01). 3 trials. Death/Dependency 1) 6 - 52 week follow-up: OR 0.80 (95% CI 0.67 to 0.97; p<0.00001). 23 trials 2) 5 - yr follow-up: 0.54 (95% CI 0.22 to 1.34; p=0.18). 3 trials. 3) 10 - yr follow-up: 0.70 (95% CI 0.27 to 1.80; p=0.45). 3 trials. Length of stay in hospital and/or institution: (SMD -0.15, 95% CI -0.32 to 0.02; p=0.09). 18 trials. Key Points: Stroke patients who receive organized inpatient care in a stroke unit are more likely to be alive, independent, and living at home one year after the stroke. The benefits were most apparent in units based in a discrete ward.
Zhang et al. 2014 **China**	N/A	Meta-analysis of 37 RCTs comparing patients (n=5,916) receiving post-stroke rehabilitation to patients receiving no	Trials were selected based on adults with stroke, and those that either received rehabilitation, which	Primary Outcome: Functional Improvement (Barthel Index), Impairment (Fugl-Meyer Score).	The average change score for patients receiving rehabilitation was more than one SD higher than that of the control group: Functional Improvement (BI):

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Systematic Review and Meta-analysis		formal post-stroke rehabilitation (control).	required patients to move or be active as part of the treatment, or no rehabilitation. Analysis was conducted using standardized mean difference and weighted mean differences in change scores between intervention and control arms. Corresponding 95% confidence intervals were estimated using a random-effects meta-analysis model.		Standardized mean difference: +1.04 (95% CI: 0.88–1.21, p<0·001) Impairment (FMS): Standardized mean difference: +1.10 (95% CI: 0.82–1.38, p<0.001) Key Points: Rehabilitation post stroke is more effective than no rehabilitation for improving activities of daily living and reducing disability.
Chan et al. 2013 **UK** **Systematic Review and Meta-analysis**	N/A	Meta-analysis of 14 RCTs comparing acute, rehabilitation and comprehensive stroke care.	Trials organized into 3 groups: 1) Acute: Discharge patients within 7 days 2) Rehabilitation: accepts patients after seven-days and focus on rehabilitation 3) Comprehensive: accept patients acutely, and also provide rehabilitation for several weeks if necessary Outcomes were pooled using random effects models and reported as Peto Odds Ratios or weighted mean differences (WMD), as appropriate. Heterogeneity was assessed using the I^2 statistic.	Primary Outcome: Mortality, Death or Dependency.	Mortality OR (95% CI): Acute: 0.80 (0.61–1.03) Rehabilitation: 0.60 (0.44–0.81) Comprehensive: 0.71 (0.54–0.94) Overall: 0.71 (0.60–0.83) Dependency OR (95% CI): Acute: 0.70 (0.56–0.86) Rehabilitation: 0.63 (0.48–0.83) Comprehensive: 0.50 (0.39–0.65) Overall: 0.62 (0.53–0.71)

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
Foley et al. 2007 **Systematic Review and Meta-analysis**	N/A	14 RCTs and quasi-RCTs comparing stroke unit care to conventional care were identified, 5 of which investigated post-acute rehabilitation. 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 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). Outcomes were pooled using random effects models and reported as Peto Odds Ratios or weighted mean differences (WMD), as appropriate. Heterogeneity was assessed using the I^2 statistic.	Outcomes: Mortality, death or dependency, and length of hospital stay.	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 Length of Stay (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 **Systematic Review and Meta-analysis**	N/A	25 observational studies comparing stroke unit care to non-stroke unit care (42,236 participants).	Observational studies comparing patients treated in stroke units to those treated in non-stroke units were identified. Data was pooled where possible and is reported as Odds Ratios. Heterogeneity was assessed using the I^2 statistic. Analyses used random effects models.	Primary Outcome: 12-month mortality. Secondary Outcome: Poor outcome (death, discharge location other than home, dependence in daily activities).	Death: OR=0.79, 95% CI 0.73–0.86, p<0.001 (I^2=45.5%). Results from 17 trials included. Death (multi-centered trials only): OR=0.82, 95% CI 0.77–0.87, p<0.001 (I^2=0%). Results from 8 trials included. Poor outcome: OR=0.87, 95% CI 0.80–0.95, p<0.01 (I^2=55.0%). Results from 15 trials included.
Chan et al. 2014 **UK** **RCT**	CA: ☑ Blinding: Patient ☒ Assessor☑	41 consecutive stroke (ischemic or hemorrhagic) patients admitted to hospital within 24-48 hours of	Patients were randomized into a combined acute/rehabilitation unit (n=20) or a traditional	Primary Outcomes: Effectiveness: (Change in FIM) Efficiency: (Change in FIM / LOS)	Combined Stroke Unit: FIM Admission: 67.5±28.0 (p=0.51) FIM Discharge: 103.6±22.2 (p=0.77) FIM 90 days post-discharge: 109.5±21.7 (p=0.89) LOS = 24.2±14.2 (p=0.35)

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
	ITT: ☑	stroke event and in need of ongoing rehabilitation. **Exclusion criteria:** Patients with a TIA, comatose, in no need of rehabilitation, severe comorbidities and requiring neurosurgery.	separated acute/rehabilitation unit (n=21).	Timing of Assessment: Admission, Discharge and 90 days post-discharge.	Efficiency: 1.6, 0.87–2.8 (p=0.0393) Traditional Stroke Unit: FIM Admission: 71.5±32.6 (p=0.51) FIM Discharge: 99.5±27.7 (p=0.77) FIM 90 days post-discharge: 104.4±27.9 (p=0.89) LOS: 29.4±14.2 (p=0.35) Efficiency: 0.82, 0.27–1.57 (p=0.0393) Key Points: Combined stroke care was just as effective as traditionally separated stroke care reflected in functional independence measure scores, but significantly more efficient as shown in greater functional independence measure efficiency.
Juby et al. 1996 **UK** **RCT**	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 were expected to be discharge within 2 weeks were excluded. 18% of those assessed met inclusion criteria.	Participants were randomized to receive inpatient rehabilitation on a stroke unit (n=176) or a general medical and geriatric unit (n=139).	Outcomes: Barthel Index, Rivermead Motor Assessment and ADL Scale, Nottingham Extended ADL, General Health Questionnaire, Cognitive and Instrumental Readjustment Scale, and non-specified mood rating scales. Timing of Assessment: baseline, 3, 6, and 12 months.	Participants randomized to receive stroke unit care had significantly longer lengths of stay than those receiving care in a conventional ward (81±41.7 vs. 63.2±46.9 days, p<0.01). 12-month mortality rates did not differ 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 stroke unit were significantly more independent in ADLs and extended ADLs (Barthel Index, Rivermead ADL Scale, and the Nottingham Extended ADL Scale), as compared to those treated in the conventional ward (p<0.05); however, at 12 months, only scores on the Nottingham Extended ADL Scale differed significantly between groups (p<0.05). No significant between group differences were found at 3, 6, or 12 months with respect to the 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 General Health Questionnaire at the 12-month follow-up (p<0.05). Lost 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%
Lincoln et al. 2000 **Drummond et**	CA: ☒ Blinding: Patient ☒	5- and 10-year follow-up of the 315 stroke patients who were candidates for inpatient rehabilitation	Participants were randomized to receive inpatient rehabilitation on a stroke unit (n=176) or a	Outcomes: Death, death or dependency (Barthel Index <18), and death or institutionalization.	5-year follow-up (Lincoln et al. 2000): 5-years following randomization, fewer patients treated in the stroke unit had died (45% vs. 55%) while a greater percentage were disabled (34% vs.

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
al. 2005 **RCT** **(Follow-up of Juby et al. 1996)**	Assessor☑ ITT: ☒	included in Juby et al. 1996. 285 and 300 individuals were traced at the 5- and 10-year follow-up, respectively. 87% (139/159) and 88% (59/67) of traced survivors were assessed at the 5- and 10-years, respectively.	conventional ward (n=139).	<u>Timing of Assessment:</u> 5- and 10-years post randomization.	27%) or institutionalized (12% vs. 8%), as compared to those treated in the conventional ward. Survival analyses significantly favoured stroke unit care over conventional care (log rank test=4.36, p<0.05). Death: RR=0.8, 95% CI 0.65–1.01. Death/Dependency: RR=0.91, 95% CI 0.83–0.99. Death/Institution: RR=0.90, 95% CI 0.75–1.08. <u>10-year follow-up (Drummond et al. 2005):</u> 10-years following randomization, fewer patients treated in the stroke unit had died (69% vs. 80%) while a greater percentage were disabled (67% vs. 43%) or institutionalized (20% vs. 10%), as compared to those treated in the conventional ward. Survival analyses significantly favoured stroke unit care over conventional care (log rank test=6.63, p<0.05). Death: RR=0.87, 95% CI 0.78–0.97. Death/Dependency: RR=0.99, 95% CI 0.94–1.05. Death/Institution: RR=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 **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 on the basis of 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). Participants were then randomized to a stroke rehabilitation unit (n=126) or a general medical unit (n=126).	<u>Outcomes:</u> 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), as 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 a significantly lower mortality rate (37% vs. 67%, p<0.05) and a

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
					significantly shorter length of stay (52.3±19.8 vs. 123.2±48.2, p<0.001), as compared to those treated in the general medical ward; however, no differences were found with respect to discharge destination or change in Barthel Index score (both at p>0.05).
Tamm et al. 2014 **Canada** **Retrospective Cohort Study**	N/A	805 stroke patients admitted to one of 2 community hospitals.	Patients were admitted to 2 types of units: Stroke Care Unit (SCU): Patients were cared for by a multidisciplinary team that included stroke neurologists (n=358) General medical ward (Gen): Patients were cared for in general medical wards by internists (n=447)	Primary Outcomes: Mortality, LOS, Discharge Home.	Hospital 1 SCU Mortality (%): 8.3 Gen Mortality(%): 17.1 p<0.001 SCU LOS (median, IQR): 8 (3–19) Gen LOS(median, IQR): 12 (5–26) p=0.027 SCU Discharge Home(%): 43.8 Gen Discharge Home(%): 25.7 p<0.001 Hospital 2: SCU Mortality(%): 19.4 Gen Mortality(%): 18.8 p=0.688 SCU LOS(median, IQR): 8 (5–30) Gen LOS(median, IQR): 14 (5–36) p=0.136 SCU Discharge Home(%): 34.4 Gen Discharge Home(%): 28.2 p=0.688 Key Points: Establishing a SCU in a community hospital not only increases the survival of stroke patients, but also the proportion of patients discharged home to live independently.
West et al. 2013 **Australia** **Prospective Observational**	N/A	146 stroke patients (>18 years; first or recurrent stroke; within 14 days of index event).	Patients were admitted to 2 types of units: Acute Stroke Unit (ASU): Patients admitted acutely, discharged early, and may include intensive	Primary Outcomes: Physical Activity, LOS, Discharge Home.	Physical Activity (% of day active, IQR): CSU: 18.0% (IQR 8.0–35.0) ASU: 3.8% (IQR 0.0–9.5) CSU spent 14.1% more of the day in moderate or high activity than ASU (95% CI: 9.3%–19.0%) LOS (Median, IQR): CSU: 14.0 days (IQR 9.5–19.5)

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
Study			monitoring, high nurse to patient ratios, and potential for life support Comprehensive Stroke Unit (CSU): Combines acute care and rehabilitation, admitting patients acutely but also providing a period of rehabilitation if required.		ASU: 13.0 days (IQR 8.0–19.5) Discharge Home (OR): odds of discharge directly home was significantly higher from the CSU than the ASU (OR 3.1; 95% CI 1.5–6.5; p=0.003) Key Points: Patients in the CSU spent more of the day in moderate or high activity and were more likely to be discharged home relative to ASU patients.
Foley et al. 2013 **Canada** **Retrospective Cohort Study**	N/A	6709 stroke patients admitted to inpatient rehabilitation.	Patients were admitted to 2 types of units: Stroke Rehabilitation Units (SRU): the presence of a collection of geographically distinct, stroke-dedicated beds and dedicated therapists (n=1725, 25.7%). Non-Dedicated SRU (Non-SRU): patients identified from the National Rehabilitation Reporting System database (n=4984, 74.3%).	Primary Outcome: LOS, FIM gain, FIM efficiency, Discharge Home Timing of Assessment: Admission, Discharge	LOS (Mean±SD): SRU: 42.10±25.9 Non-SRU: 35.4±27.2 p<0.001 FIM Gain: SRU: 22.3±14.5 Non-SRU: 22.1±16.8 p=0·748 FIM Efficiency: SRU: 0.62±0.47 Non-SRU: 0.88±1.03 p<0.001 Discharge Home (n, %): SRU: 1216 (70.5%) Non-SRU: 3430 (68.8%) p<0.001 Key Points: Patients admitted to dedicated stroke rehabilitation units fared no better on commonly-used process metrics compared with patients admitted to non-dedicated, rehabilitation units.
Di Carlo et al., 2011 **(EROS Project)** **Italy** **Observational Study**	N/A	355 consecutive patients with a first-ever stroke. Patients with subarachnoid hemorrhage were excluded.	Patients were admitted to either a stroke unit (n=140) or to a general medical ward (n=215). Stroke unit care was provided in an 8-bed, semi-intensive, multidisciplinary care unit. Mean Length of hospital	Primary Outcomes: death, death/dependency (Barthel Index=0.9), and death/institutionalization. Timing of Assessment: baseline and at 3-month and 1-year follow-up.	Death: RR=0.57, 95% CI 0.33–0.97, p<0.05 (3-mth); RR=0.54, 95% CI 0.34–0.84, p<0.01 (1-yr). Death/dependency: RR=0.58, 95% CI 0.40–0.83, p<0.01 (3-mth); RR=0.65, 95% CI 0.48–0.89, p<0.01 (1-yr). Death/institutionalization: RR=0.53, 95% CI 0.33–0.86, p<0.01 (3-mth); RR=0.51, 95% CI 0.33–0.79,

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			stay was 12.5 (SD 10.7) and 13.1 (SD 12.6) days for patients admitted to the stroke unit and the general medical ward, respectively.		p<0.01 (1-yr).
Saposnik et al., 2011 **Canada** **Prospective Cohort Study**	N/A	6,223 patients with a first-ever ischemic stroke admitted to one of 12 stroke centers participating in a registry.	Consecutively admitted patients were admitted to either a stroke unit (n=4,157) or a non-stroke unit (n=2,066): admissions decisions were based primary on bed availability. Patients were categorized according to the following stroke subtypes: cardioembolic, large artery disease, small vessel disease, or other.	Primary Outcome: 30-day mortality. Secondary Outcomes: 7-day mortality, and death/institutionalization at discharge.	For all patients combined, 30-day mortality was 12.2%. Across all stroke types, patients treated in stroke units had significantly reduced 30-day mortality as compared to patients who received less organized care, controlling for age, gender, comorbidity and stroke severity: cardioembolic (OR=0.46, 95% CI 0.36–0.59), large artery disease (OR=0.39, 95% CI 0.27–0.56), small vessel disease (OR=0.48, 95% CI 0.27–0.88), and other (OR=0.45, 95% CI 0.29–0.70), all at p<0.01. 7-day mortality and death/ institutionalization were also significantly reduced among patients treated in a stroke unit.

Glossary
RCT= Randomized Controlled Trial
N/A = Not Applicable
CA = Concealed Allocation
ITT = Intention to treat
OR = Odds Ratio
CI = Confidence Interval
IQR = Interquartile Range

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