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Effectiveness of an Early Supported Discharge Service for Persons Hospitalized After a Stroke Episode: A Special Report

Health Quality Ontario

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Conflict of Interest Statement

All authors in the Evidence Development and Standards branch at Health Quality Ontario are impartial. There are no competing interests or conflicts of interest to declare.

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Health Quality Ontario strives to promote health care that is supported by the best available scientific evidence. The Evidence Development and Standards branch works with expert advisory panels, clinical experts, scientific collaborators, and field evaluation partners to conduct evidence-based reviews that evaluate the effectiveness and cost-effectiveness of health interventions in Ontario.

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In addition, Evidence Development and Standards collects and analyzes information about how a health intervention fits within current practice and existing treatment alternatives. Details about the diffusion of the intervention into current health care practices in Ontario add an important dimension to the review. Information concerning the health benefits, economic and human resources, and ethical, regulatory, social, and legal issues relating to the intervention may be included to assist in making timely and relevant decisions to optimize patient outcomes.

Disclaimer

This report was prepared by the Evidence Development and Standards branch at Health Quality Ontario or one of its research partners for the Ontario Health Technology Advisory Committee and was developed from analysis, interpretation, and comparison of scientific research. It also incorporates, when available, Ontario data and information provided by experts and applicants to HQO. The analysis may not have captured every relevant publication and relevant scientific findings may have been reported since the development of this recommendation. This report may be superseded by an updated publication on the same topic. Please check the Health Quality Ontario website for a list of all publications: http://www.hqontario.ca/evidence/publications-and-ohtac-recommendations.

Abstract

Background

A stroke is a sudden loss of brain function caused by either the interruption of blood flow to the brain (ischemic stroke) or the rupture of blood vessels in the brain (hemorrhagic stroke). About 80% of strokes are ischemic and 20% are hemorrhagic.

Objectives

The objective of this evidence-based analysis is to compare the effectiveness of an early supported discharge (ESD) service with usual care (UC) for persons hospitalized for stroke.

Data Sources

A literature search was performed using Ovid MEDLINE, Ovid MEDLINE In-Process and Other Non-Indexed Citations, Ovid Embase, EBSCO Cumulative Index to Nursing & Allied Health Literature (CINAHL), the Wiley Cochrane Library, and the Centre for Reviews and Dissemination database for studies published from January 1, 2011, until December 20, 2011.

Review Methods

Abstracts were reviewed by a single reviewer, and full-text articles were obtained for studies meeting the eligibility criteria. The database search yielded 478 citations, although none met the inclusion criteria. As a result, the 2009 Cochrane systematic review represents current best evidence regarding the effectiveness of ESD. An additional study obtained from an electronic citation was added to this systematic review. The quality of the body of evidence was examined using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) Working Group criteria.

Results

Persons who receive ESD services have up to an 8-day reduction in the length of their initial hospital stay compared with those who receive UC. Patients who receive ESD team co-ordination and delivery have a 34% reduction in mortality or institutionalization. Differences between UC and ESD with respect to mortality and readmissions to hospital were not significant.

Limitations

Published data were extracted from original reports. Unpublished data reported in the 2009 Cochrane Review were also included in the meta-analysis. Data extraction was completed by one reviewer.

Conclusions

Early supported discharge services reduce the length of hospital stay as well as rates of institutionalization and mortality in persons hospitalized because of stroke.

Plain Language Summary

Early supported discharge services are provided by teams of rehabilitation therapists and other specialists in stroke care who work together to get people who have had a mild or moderate stroke home as early as possible after their hospitalization. This review, which identified 11 randomized controlled trials with 863 participants, found that persons who received early supported discharge returned home earlier and were less likely to be admitted to a long-term care facility after being hospitalized for their strokes.

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List of Abbreviations

CCAC	Community Care Access Centre
CI	Confidence interval(s)
CINAHL	Cumulative Index to Nursing & Allied Health Literature
ESD	Early supported discharge
FIM	Functional independence measure
GRADE	Grading of Recommendations Assessment, Development and Evaluation
OR	Odds ratio
RCT	Randomized controlled trial
RR	Relative risk
SD	Standard deviation
TIA	Transient ischemic attack
UC	Usual care

Background

Objective of Analysis

The objective of this evidence-based review was to determine the effectiveness of early supported discharge (ESD) interventions for persons hospitalized with stroke.

Clinical Need and Target Population

Description of Disease/Condition

A stroke is a sudden loss of brain function caused by the interruption of blood flow to the brain (ischemic stroke) or the rupture of blood vessels in the brain (hemorrhagic stroke) and can affect several functions, including the ability to move, see, remember, speak, reason, read, and write. (2) About 80% of strokes are ischemic and 20% are hemorrhagic. (2) A transient ischemic attack (TIA), also known as a "mini-stroke," is caused by a temporary interruption of blood flow to the brain. A TIA is an important warning sign of an increased risk of a complete stroke. (2) Roughly 50% to 70% of people who have had a stroke regain their independence, while up to 30% are permanently disabled. Stroke rehabilitation uses a co-ordinated multidisciplinary approach to retrain individuals to reach their maximum physical, psychological, social, and vocational recovery. (3) The goal of a stroke rehabilitation program is to optimize patients' neurologic recovery, teach them strategies to compensate for residual deficits, and help them to return to independent living (including psychosocial interventions to manage depression). (3) Rehabilitation remains the fundamental and core treatment for patients recovering from stroke. (3)

Canadian Prevalence

Stroke is the leading cause of adult neurologic disability in Canada—300,000 people (1% of the population) live with its effects. (4)

Ontario Incidence

In 2009, 10,238 male and 9,764 female patients presented to an emergency department in Ontario with a stroke or a TIA. (5) Their mean age was 72.3 years, and more than half were between 65 and 85 years of age. More than a third (37%) of patients presented with a TIA, 4.9% presented with an ischemic stroke, and 8.5% with a hemorrhagic stroke. In the remaining 50% of patients, the stroke type could not be determined retrospectively. (5) About a third of people suffering from a stroke or a TIA seek medical attention within 2.5 hours of onset. (5)

Ontario Context

The Heart and Stroke Foundation of Ontario (6) reports that stroke survivors are often discharged from hospital before being assessed for the rehabilitation services they need. Similarly, Ontario home care data show that the use of stroke rehabilitation services in the home varies across the province. (6) The average number of rehabilitation services offered by Community Care Access Centres (CCACs) over a 60-day period to people discharged from hospital after an acute stroke episode in 2007/2008 was 4 visits for physical therapy, 3 for occupational therapy, 3 for speech-language pathology, and 3 for social work. (5) Recent data show that up to 28% of patients discharged from acute inpatient hospitalization received inpatient rehabilitation. A provincial mean functional independence measure (FIM) score of 76 suggests that patients receiving inpatient rehabilitation are more likely to have mild stroke than severe stroke (FIM score < 60). (5)

Technology/Technique

Early supported discharge after stroke is a service provided by teams of rehabilitation therapists and other specialists in stroke care who work together to get people home as early as possible after acute hospitalization. (1) This model of care links inpatient care with community rehabilitation and other services. (7) Through this service, eligible patients who have mild to moderate stroke are discharged after a shorter hospital stay and receive their rehabilitation at home. (7) Other names for this intervention include *early supported discharge schemes*, *accelerated discharge schemes*, and *postdischarge support services*. (1) For the purpose of this review, ESD interventions are defined as interdisciplinary rehabilitation provided at home or in the community during a period when the patient would normally be in an inpatient stroke rehabilitation unit. (8)

Evidence-Based Analysis

Research Question

What is the effectiveness of early supported discharge (ESD) interventions compared with usual care (UC) for persons hospitalized with stroke?

Research Methods

Literature Search

Search Strategy

A preliminary search identified 1 Cochrane database systematic review (1) and 1 web-based systematic review (8) with literature search dates up to and including 2004 and 2011, respectively. With this knowledge, a literature search was performed between December 16, 2011, and December 20, 2011, using Ovid MEDLINE, Ovid MEDLINE In-Process and Other Non-Indexed Citations, Ovid Embase, EBSCO Cumulative Index to Nursing & Allied Health Literature (CINAHL), the Wiley Cochrane Library, and the Centre for Reviews and Dissemination database, for studies published from January 1, 2011, to December 20, 2011. Abstracts were reviewed by a single reviewer and, for those studies meeting the eligibility criteria, full-text articles were obtained. Reference lists were also examined for any additional relevant studies not identified through the search.

Inclusion Criteria

- published between January 1, 2011, and December 20, 2011;
- randomized controlled trials (RCTs), systematic reviews, and meta-analyses;
- adult population admitted to hospital with a clinical diagnosis of stroke;
- treatment including any intervention that aimed to accelerate discharge from hospital with the provision of support (with or without a "therapeutic" rehabilitation intervention) in a community setting;
- comparator of usual care;
- English-language text.

Exclusion Criteria

- study sample size less than 30,
- poorly defined or understood intervention,
- grey literature.

Outcomes of Interest

- death,
- death or institutionalization,
- institutionalization,
- length of stay,
- hospital readmissions.

Statistical Analysis

Where appropriate, a meta-analysis was undertaken to determine the pooled estimate of effect of early supported discharge (ESD) compared with UC for explicit outcomes using Review Manager 5, version 5.1.6. A fixed or random effects model was used following the guidance of the Cochrane handbook. (9) Relative risk calculated with use of the Mantel-Haenszel method was used as the pooled summary estimate for binary data, and a mean difference was used for continuous data. Group differences were assessed through an intention-to-treat protocol. A *P* value < 0.05 was considered significant. For each outcome, the degree of statistical heterogeneity among studies was assessed with the I^2 statistic for each outcome. An $I^2 > 50\%$ was considered as substantial heterogeneity. (9) An a priori subgroup analysis was completed for 3 categories: ESD team co-ordination and delivery, ESD team co-ordination, and ESD team.

Quality of Evidence

The quality of the body of evidence for each outcome is examined according to the GRADE Working Group criteria. (10) The overall quality is determined to be very low, low, moderate, or high using a step-wise, structural methodology.

Study design is the first consideration. The starting assumption is that randomized controlled trials are high quality, whereas observational studies are low quality. Five additional factors—risk of bias, inconsistency, indirectness, imprecision, and publication bias—are then taken into account. Limitations or serious limitations in these areas result in downgrading the quality of evidence. Finally, 3 main factors are considered that could raise the quality of evidence: large magnitude of effect, dose-response gradient, and accounting for all residual confounding. (10) For more detailed information, please refer to the latest series of GRADE articles. (11)

As stated by the GRADE Working Group, the final quality score can be interpreted using the following definitions:

High	Very confident that the true effect lies close to that of the estimate of the effect
Moderate	Moderately confident in the effect estimate—the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different
Low	Confidence in the effect estimate is limited—the true effect may be substantially different from the estimate of the effect
Very Low	Very little confidence in the effect estimate—the true effect is likely to be substantially different from the estimate of effect

Results of Evidence-Based Analysis

The database search yielded 478 citations published between January 1, 2011, and December 20, 2011 (with duplicates removed). Figure 1 identifies the stage at which citations were excluded, the number, and the reasons for exclusion. For each included study, the study design was identified and is summarized in Table 1, which is a modified version of a hierarchy of study design by Goodman. (12) No relevant citations were identified. Because of this, the 2009 Cochrane review(1) represents the best evidence regarding the effectiveness of ESD. As a result, we selected the RCTs from that review that met our inclusion criteria. Of the 11 studies (13-23) included in the Cochrane review, 10 RCTs met the inclusion criteria. (13;14;16-23) One additional study (24) that met the selection criteria was obtained from an electronic citation. (8) Table 2 reports the status of the citations from the Cochrane systematic review (1) (included or excluded) and the reasons for exclusion.

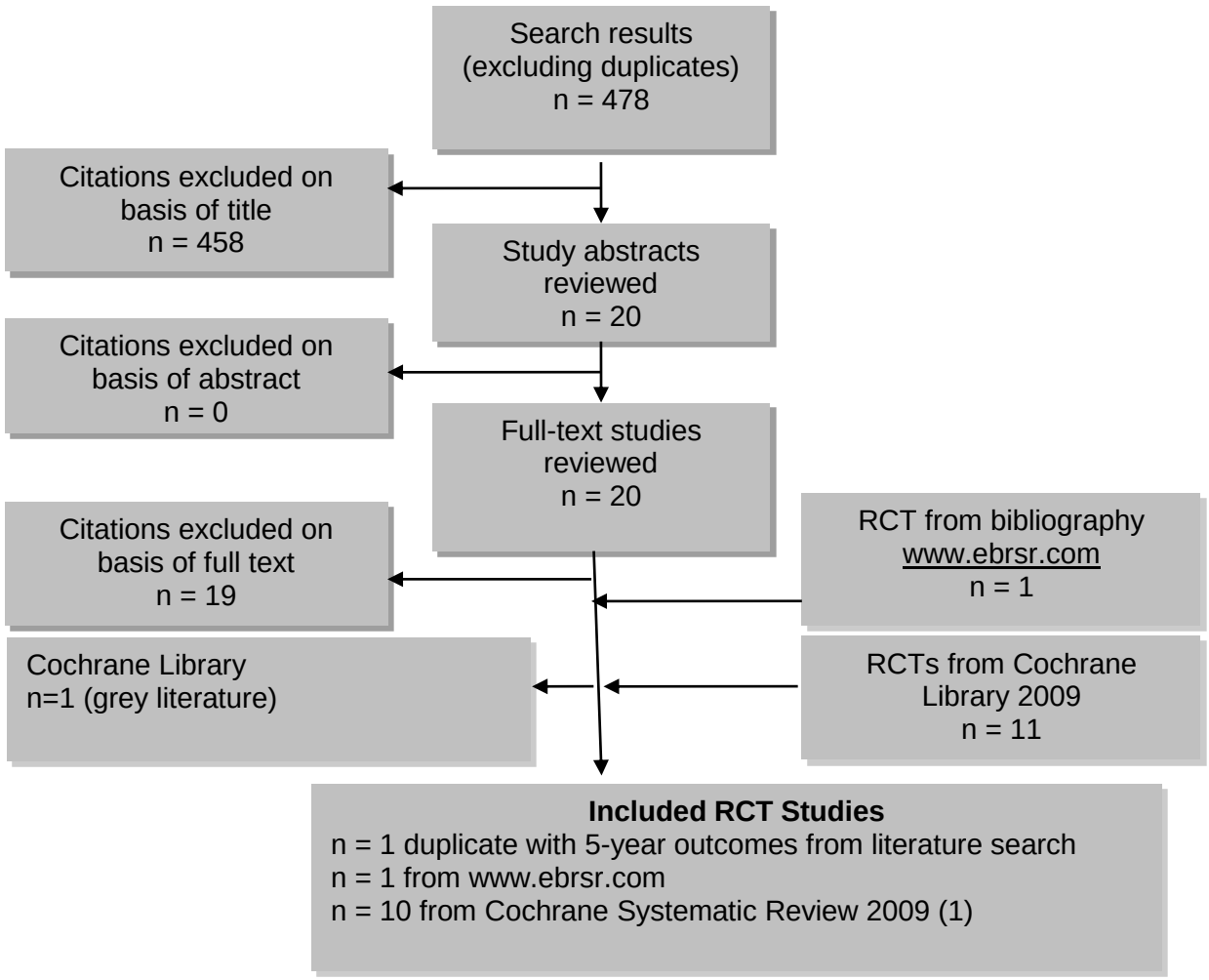


Figure 1: Citation Flow Chart

Table 1: Body of Evidence Examined According to Study Design

Study Design	Number of Eligible Studies
RCT Studies	
Systematic review of RCTs	1
Large RCT	1
Small RCT	1
Observational Studies	
Systematic review of non-RCTs with contemporaneous controls	
Non-RCT with non-contemporaneous controls	
Systematic review of non-RCTs with historical controls	
Non-RCT with historical controls	
Database, registry, or cross-sectional study	
Case series	
Retrospective review, modelling	
Studies presented at an international conference	
Expert opinion	
Total	3

Abbreviation: RCT, randomized controlled trial.

Table 2: Citation Status from Cochrane Review

Author, Year	Status	Reason for Exclusion
Rudd et al, 1997 (22)	Included	NA
Rodgers et al, 1997 (20)	Included	NA
Dey et al, 2005 (15)	Excluded	Grey literature
Ronning and Guldvog, 1998 (21)	Included	NA
Holmqvist et al, 1998 (17)	Included	NA
Anderson et al, 2000 (13)	Included	NA
Mayo et al, 2000 (19)	Included	NA
Indredavik, 2000 (18)	Included	NA
Bautz-Holter et al, 2002 (14)	Included	NA
Suwanwela et al, 2002 (23)	Included	NA
Donnelly et al, 2004 (16)	Included	NA

Abbreviations: NA, not applicable

The characteristics of the 12 RCTs (13;14;16-25) included in this review are reported in Table 3. Studies were conducted between 1997 and 2011 with sample sizes ranging from 62 to 331. One study was conducted in Canada (19), with the remainder in Norway (14;18;21;24;25), the United Kingdom, (16;20;22) Sweden, (17) Thailand, (23) and Australia. (13) Of the 12 studies, (13;14;16-25) 11 had a study population with an average age range of 68-79, (13;14;16-22;24;25) and 1 with an average age of 59. (23) Duration of follow-up ranged from 1 to 52 weeks for 11 of the studies, with the most common reported length of 6 months. (13;14;16-24) One study (25) was a 5-year follow-up to another study that is also included in this review. (18)

Table 3: Characteristics of Studies Included for Analysis

Study	Country	n	Age (mean, yr)	Population	Treatment Group	Control Group	Duration	Follow-up
Rudd et al, 1997 (22)	UK	331	71	Medically stable, lived alone; initial Barthel Index 15–19/20 (50% of patients); 45% of patients were recruited from those screened	Multidisciplinary community therapy team with special interest in stroke; co-ordinated through weekly multidisciplinary meetings. Team co-ordinated and delivered care	Conventional care (<50% managed in co-ordinated multidisciplinary stroke units) with conventional discharge planning and post-discharge support	3 months	12 months
Rodgers et al, 1997 (20)	UK	92	73	Recruited within 3 days of stroke; median Barthel Index 14/20 at 1 week after stroke; medically stable; 30% of patients screened were recruited	Community-based hospital multidisciplinary rehab team with a specialist interest in stroke; co-ordinated through weekly multidisciplinary meetings; median duration 9 wk. Team co-ordinated and delivered care	Conventional hospital care; usually in medical wards (<50% received organized multidisciplinary stroke unit care)	3 months	3, 6,12 months
Ronning and Guldvog, 1998 (21)	Norway	251	75	Age ≥60; median Barthel Index 50/100; 43% of patients screened were recruited	Community rehab provided; services did not specialize in stroke and were not consistently co-ordinated through multidisciplinary team meetings	Conventional inpatient rehab; multidisciplinary (specialist interest in stroke) and co-ordinated through weekly team meetings	NR	7 months
Holmqvist et al, 1998 (17)	Sweden	83	72	Cerebral infarct or primary intracerebral hemorrhage; 5–7 days after stroke; 38% of patients screened were included	Multidisciplinary hospital ESD team with special interest in rehab and co-ordinated through weekly meetings. Therapist-based service at the hospital stroke unit. Team co-ordinated and delivered care	Conventional hospital care involving co-ordinated multidisciplinary stroke unit care	3—4 months	3, 6,12 months

Study	Country	n	Age (mean, yr)	Population	Treatment Group	Control Group	Duration	Follow-up
Anderson et al, 2000 (13)	Australia	86	72	Diagnosis of stroke in previous 6 months; medically stable; median Barthel Index 85/100; trial included 22% of stroke patients admitted to hospital	Multidisciplinary community rehab team; hospital and community services; team co-ordinated and delivered care	Conventional rehab in a neurologic rehabilitation unit; multidisciplinary care	Median 5 weeks (1—19 weeks range)	6 months
Mayo et al, 2000 (19)	Canada	114	70	Patients admitted for acute stroke; Had a caregiver at home willing to provide live-in care for 4 weeks postdischarge	Prompt discharge with immediate provision of follow-up services by a multidisciplinary team; 4-week duration	Current practices for discharge planning and referral for follow-up services	4 weeks	1 month, 2 months from baseline
Indredavik et al, 2000 (18)	Norway	320	74	Admitted to a stroke unit; acute stroke < 7 days; mean Barthel index 60/100; 68% of admissions included	Hospital stroke team based in stroke unit arranged discharge to home or rehab unit; co-ordinated rehab, support services, and follow up; team coordinated care delivered by other agencies	Conventional procedures with acute care and early rehab in a stroke unit and discharge to home or to a rehab unit	4 weeks	6 weeks, 6 months
Fjaertoft et al, 2011(25)	Norway	320	74	Admitted to a stroke unit; acute stroke < 7 days; mean Barthel index 60/100; 68% of admissions included	Hospital stroke team based in stroke unit arranged discharge to home or rehab unit; co-ordinated rehab, support services, and follow-up; team co-ordinated care delivered by other agencies	Conventional procedures with acute care and early rehab in a stroke unit and discharge to home or to a rehab unit	4 weeks	5 years
Bautz-Holter et al, 2002 (14)	Norway	82	79	Hospitalized stroke patients within 6 days of onset admitted to a	Assessment by multidisciplinary team; co-ordinated discharge and arranged for continued rehab	Conventional discharge and continued rehabilitation	4 weeks	3, 6 months

Study	Country	n	Age (mean, yr)	Population	Treatment Group	Control Group	Duration	Follow-up
				stroke unit Median Barthel index sum score at day 7: 15/20 Male: 45% Excluded patients with subarachnoid hemorrhage	provided by general community services			
Suwanwela et al, 2000 (23)	Thailand	102	59	Patients presenting with acute stroke within 48 hours of symptom onset	ESD; home rehabilitation by relatives/carers	Rehab therapy in hospital until discharge; family members encouraged to participate with rehabilitation team so they could assist in home rehab	NR	6 months
Donnelly et al, 2004 (16)	UK	113	68	Hospitalized stroke patients within 3 weeks of onset; medically stable; baseline Barthel index 14/20 Male 55%	Community rehab team; co-ordinated through weekly team meetings. Team co-ordinated and delivered care	Conventional care; medical ward, geriatric medical ward and stroke unit; most managed by a multidisciplinary team with special interest in stroke; co-ordinated through weekly multidisciplinary team meetings	3 months	6,12 months
Askim et al, 2004 (24)	Norway	62	76	Admitted to a stroke unit; living at home before the stroke; inclusion within 7 days after onset of symptoms	Home-based program of follow-up care co-ordinated by mobile stroke team that worked closely with primary health care system during first 4 weeks after discharge	Primary health care system organized further inpatient rehab or follow-up programs	NR	1, 6, 26, and 52 weeks

Abbreviation: ESD, early supported discharge; n, study sample size; NR, not reported; UK, United Kingdom.

Early supported discharge programs varied in how they were delivered (Table 4). Six studies (13;16;17;19;20;22) used ESD team co-ordination and delivery service provision, 3 studies (14;18;24) used only ESD team co-ordination of service provision, and 2 studies did not use a team approach at all. (21;23) All 11 studies (13;14;16-24) used a control group of patients admitted to either a general medical ward or a stroke unit.

Early supported discharge team co-ordination and delivery involved a multidisciplinary team that met regularly and was responsible for co-ordinating discharge from hospital, organizing postdischarge care, and providing rehabilitation and patient care at home. (1) The ESD team co-ordination–only service provision was provided by a multidisciplinary team responsible for planning for and supervision of the discharge home and the immediate postdischarge care of the patient. Care was subsequently handed over to an existing community-based agency that provided continuing rehabilitation and support at home but did not usually provide co-ordinated multidisciplinary team care. (1) The no—ESD team service provision involved patients receiving multidisciplinary team care in hospital that ended upon discharge. Care was subsequently provided by a range of community stroke services that were not co-ordinated by a multidisciplinary team. (1)

Table 4: Characteristics of Intervention

Author, Year	ESD	Control	Type of Discharge Team
Rudd et al, 1997 (22)	ESD team co-ordination and delivery	GMW [a]	Hospital
Rodgers et al, 1997 (20)	ESD team co-ordination and delivery	GMW	Community
Holmqvist et al, 1998 (17)	ESD team co-ordination and delivery	SU	Hospital
Donnelly et al, 2004 (16)	ESD team co-ordination and delivery	SU [a]	Community
Mayo et al, 2000 (19)	ESD team co-ordination and delivery	GMW	Community
Anderson et al, 2000 (13)	ESD team co-ordination and delivery	SU	Community
Indredavik et al, 2000 (18) [b]	ESD team co-ordination	SU	NA
Bautz-Holter et al, 2002 (14)	ESD team co-ordination	SU	NA
Askim et al, 2004 (24)	ESD team co-ordination	SU	NA
Ronning and Guldvog, 1998 (21)	No ESD team	SU	NA
Suwanwela et al, 2000 (23)	No ESD team	SU	NA

Abbreviations: ESD, early supported discharge; GMW, general medical ward; NA, not applicable; SU, stroke unit; SU, stroke unit.
[a] Most people in study admitted to this type of control ward. [b]Same study as Fjaertoft et al. (25)

The proportion of people with an ischemic or hemorrhagic stroke or a TIA that were included in the studies is reported in Table 5. More than 80% of the study population in the 7 studies (13;17;18;20;21;23;24) that reported this information had an ischemic stroke.

Table 5: Proportion of Stroke Types Included in Studies

Type of Stroke	Author, Year										
	Rudd et al, 1997 (22)	Rodgers et al, 1997 (20)	Holmqvist et al, 1998 (17)	Donnelly et al, 2004 (16)	Mayo et al, 2000 (19)	Anderson et al, 2000 (13)	Indredavik et al, 2000 (18) [a]	Bautz-Holter et al, 2002 (14)	Askim et al, 2004 (24)	Ronning and Guldvog, 1998 (21)	Suwanwela et al, 2002 (23)
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Ischemic	NR	97	95	NR	NR	87	90	NR	82	92	100
Hemorrhagic	NR	0	5	NR	NR	13	9	NR	16	8	0
TIA	NR	0	0	NR	0	0	0	NR	2	0	0
Other	NR	3	0	NR	0	0	1	NR	0	0	0

Abbreviations: NR, not reported, TIAs, transient ischemic attacks.
[a] Same study as Fjaertoft et al. (25)

Seven studies (13;14;16;18;20;21;24) reported the median or mean Barthel Index at Baseline (Table 6). The data suggest that study participants could be classified as having a stroke of moderate or higher severity.

Table 6: Proportion of Stroke Types Included in Studies and Baseline Barthel Index

Baseline Barthel Index [a]	Author, Year										
	Rudd et al, 1997 (22) [b]	Rodgers et al, 1997 (20)	Holmqvist et al, 1998 (17)	Donnelly et al, 2004 (16)	Mayo et al, 2000 (19)	Anderson et al, 2000 (13)	Indredavik et al, 2000 (18) [c]	Bautz-Holter et al, 2002 (14)	Askim et al, 2004 (24)	Ronning and Guldvog, 1998 (21)	Suwanwela et al, 2000 (23)
Median (ESD/UC)	NR	15/13	NR	14/15	NR	85/86	65/60	16/14	55/55	70/60	NR
Mean (ESD/UC)	NR	NR	NR	15/14	85/83	NR	60/58	NR	58/54	NR	NR

Abbreviations: ESD, early supported discharge; NR, not reported, TIAs, transient ischemic attacks; UC, usual care.
[a] Barthel score can range from 0 to 20 or 0 to 100, depending how it is scored. The higher the score the more independent is the person.
[b] 58% of study population with score ≥ 15.
[c] Same as Fjaertoft et al. (25)

The characteristics of the early supported discharge teams are reported in Table 7.

Table 7: Characteristics of Early Supported Discharge Teams

Author, Year	Medical	Nursing	PT	OT	SLT	SW	Other	Team Meeting [a]	Predischarge Assessment of Home
Rudd et al, 1997 (22)	✓	x	✓	✓	✓	x	Therapy aide	✓	x
Rodgers et al, 1997 (20)	x	x	✓	✓	✓	✓	OT technician, secretary	✓	EV
Holmqvist et al, 1998 (17)	x	x	✓	✓	✓	✓ [b]	x	✓	x
Donnelly et al, 2004 (16)	x	x	✓	✓	✓	x	Co-ordinator, rehabilitation assistant	✓	EV
Mayo et al, 2000 (19)	x	✓	✓	✓	✓	x	Dietary	x	x
Anderson et al, 2000 (13)	✓	✓	✓	✓	✓	✓	x	✓	EV
Indredavik et al, 2000 (18) [c]	✓	✓	✓	✓	x	x	x	✓ [d]	HV
Bautz-Holter et al, 2002 (14)	x	✓	✓	✓	x	x	x	✓	x
Askim et al, 2004 (24)	✓	✓	✓	✓	x	x	x	✓ [d]	HV

Abbreviations: EV, environmental visit (team visit home without patient); HV, home visit where patient visits their home with the team; OT, occupational therapy; PT, physical therapy; SLT, speech language therapy; SW, social worker; x, not part of team membership; ✓, included in team membership.

[a] Weekly team meetings unless otherwise noted.

[b] Attached to team on a consulting basis.

[c] Same study as Fjaertoft et al. (25)

[d] Team meeting day of discharge only.

The risk of bias among the 11 RCTs (13;14;16-24) is reported in Table 8. This information was used to evaluate the quality of the body of evidence risk of bias criterion according to the GRADE Working Group framework. Blinding refers to whether the outcome assessors were blinded to the treatment group.

Table 8: Risk of Bias Among Randomized Controlled Trials for the Comparison of Stroke Units with General Medical Wards

Author, Year	Allocation Concealment	Blinding	Complete Accounting of Patients and Outcome Events	Selective Reporting Bias
Rudd et al, 1997 (22)	No limitations	No limitations	No limitations	No limitations
Rodgers et al, 1997 (20)	Limitations [a]	Limitations [b]	No limitations	No limitations
Holmqvist et al, 1998 (17)	No limitations	No limitations	No limitations	Limitations [c]
Donnelly et al, 2004 (16)	Limitations [a]	Limitations [a]	No limitations	No limitations
Mayo et al, 2000 (19)	No limitations	No limitations	No limitations	No limitations
Anderson et al, 2000 (13)	No limitations	No limitations	No limitations	No limitations
Indredavik et al, 2000 (18) [d]	Limitations [a]	Limitations [a]	No limitations	No limitations
Bautz-Holter et al, 2002 (14)	No limitations	No limitations	No limitations	No limitations
Askim et al, 2004 (24)	No limitations	No limitations	No limitations	No limitations
Ronning and Guldvog, 1998 (21)	No limitations	Limitations [a]	No limitations	No limitations
Sunwanwela et al, 2002 (23)	Limitations[a]	Limitations[b]	No limitations	No limitations

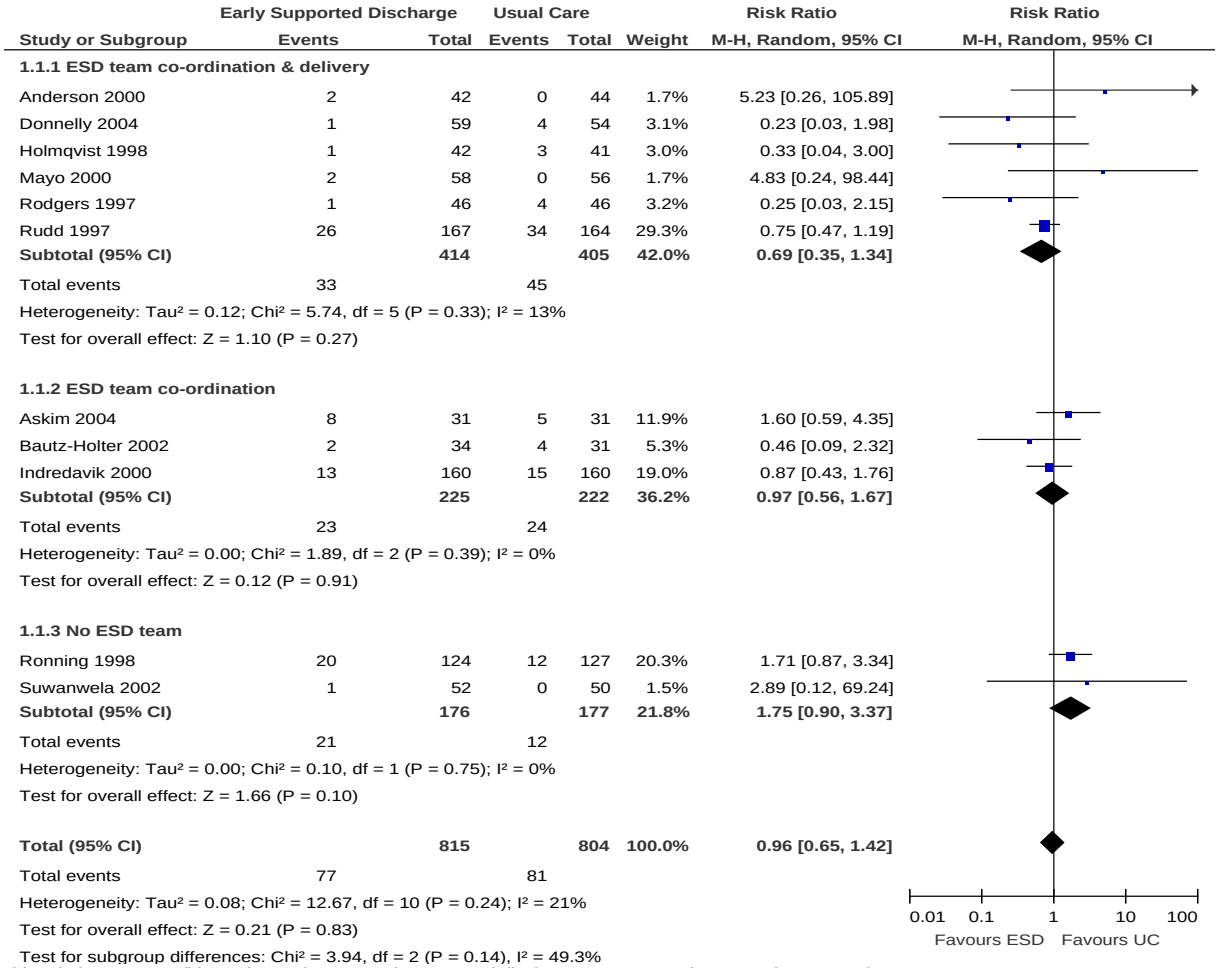
Abbreviations: RCT, randomized controlled trial.
[a] Unclear methods.
[b] Outcome assessors not blinded.
[c] Mortality is unpublished data.
[d] Same study as Fjaertoft et al. (25)

Meta-analysis

The outcome measures reported in the following meta-analysis include mortality, death or institutionalization, length of hospital stay, and rehospitalization.

Death

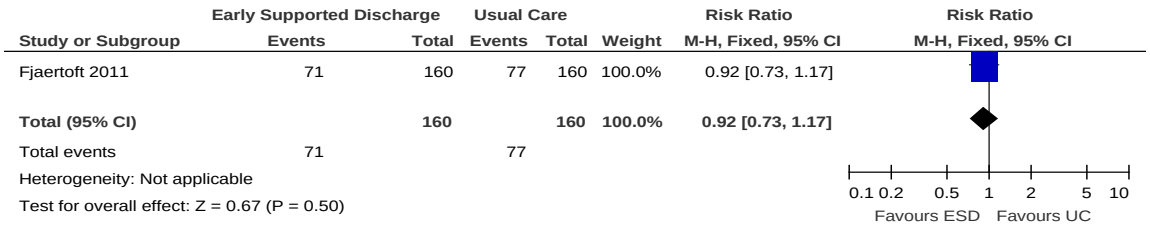
Results of 11 studies (13;14;16;17;19-25) were combined to derive a pooled estimate of effect, and a random effects model was used to generate a relative risk (RR) summary statistic. There was no statistically significant difference in death between the ESD versus UC (RR, 0.96; 95% confidence interval [CI], 0.65–1.42) (Figure 2). The I^2 value is 21%, indicating a nonsignificant heterogeneity among studies. A priori subgroup analyses were not significant. The GRADE quality of evidence was assessed as low for studies with interventions that had team co-ordination and delivery, low for studies with interventions that had only team co-ordination, and very low for studies that had no ESD team. Details of this assessment, including reasons for downgrading the quality of evidence, are reported in Appendix 2.



Abbreviations: CI, confidence interval; ESD, early supported discharge; M-H, Mantel-Haenszel; UC, usual care.

Figure 2: Death

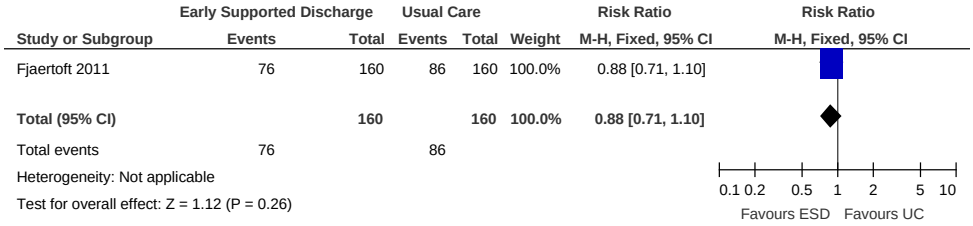
One study (25) reported death at 5-year follow-up in people receiving ESD compared with those receiving usual care (Figures 3–6). This study used ESD team co-ordination only. In that study, there were 5 losses to follow-up in the ESD group and 9 in the usual-care group. Figure 3 assumes all patients lost to follow-up are alive at 5 years. There was no difference in death between patients receiving ESD and those receiving UC (RR, 0.92; 95% CI, 0.73–1.17) (Figure 3). A sensitivity analysis was completed assuming different states for those lost to follow-up (Figures 4–6). Statistical significance was not reached for this outcome in any of the 3 sensitivity analyses.



Abbreviations: CI, confidence interval; ESD, early supported discharge; M-H, Mantel-Haenszel; UC, usual care.

Figure 3: Death at 5-Year Follow-Up; Lost to Follow-Up Are Considered Alive in Both Groups

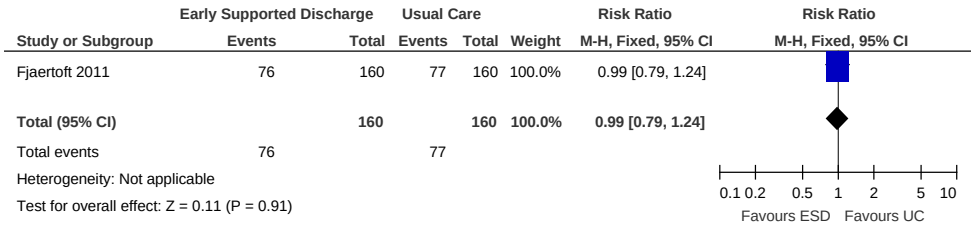
Figure 4 assumes all patients lost to follow-up are dead in both groups.



Abbreviations: CI, confidence interval; ESD, early supported discharge; M-H, Mantel-Haenszel; UC, usual care.

Figure 4: Death at 5-Year Follow-Up; Lost to Follow-Up Are Considered Dead in Both Groups

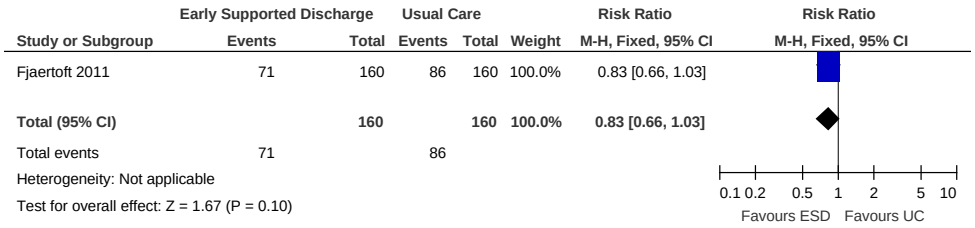
Figure 5 assumes all patients lost to follow-up at 5 years are dead in the ESD group and alive in the UC group.



Abbreviations: CI, confidence interval; ESD, early supported discharge; M-H, Mantel-Haenszel; UC, usual care.

Figure 5: Death at 5-Year Follow-Up; Lost to Follow-Up Are Considered Dead in ESD Group, Alive in UC Group

Figure 6 assumes all patients lost to follow-up in the ESD group are alive at 5 years and dead in the UC group.

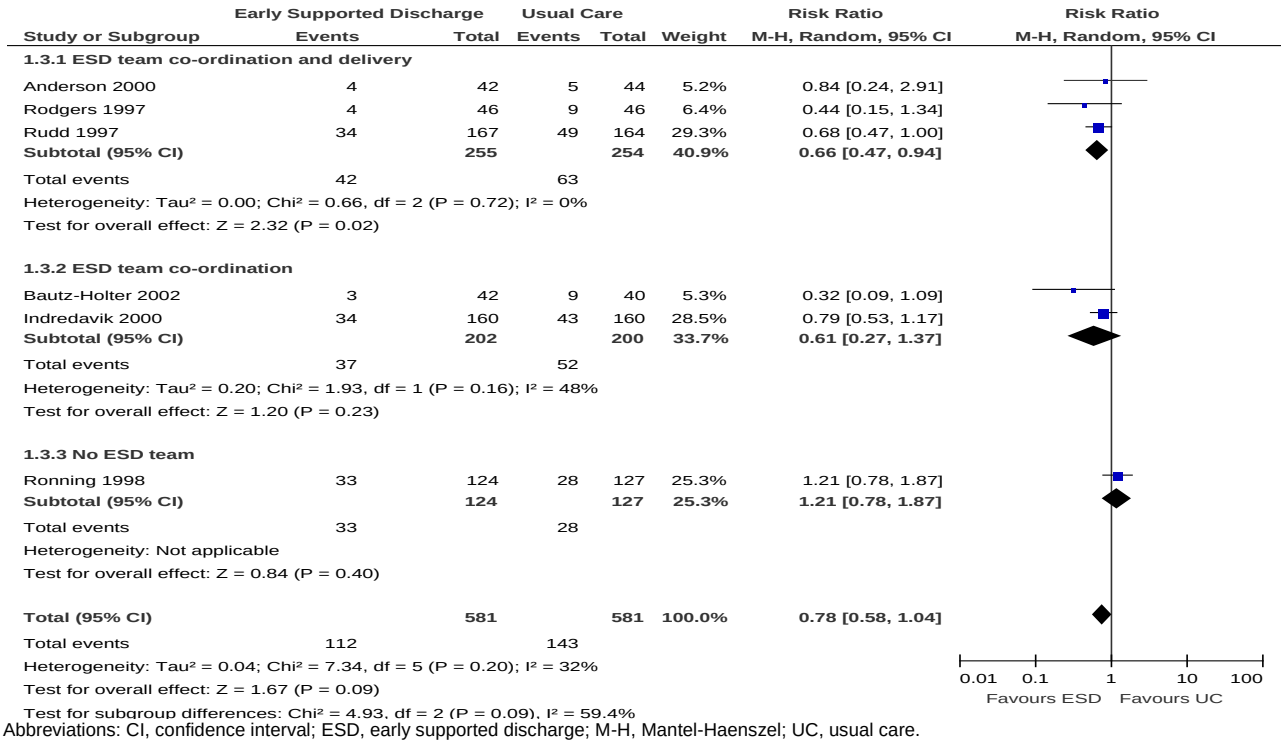


Abbreviations: CI, confidence interval; ESD, early supported discharge; M-H, Mantel-Haenszel; UC, usual care.

Figure 6: Death at 5-Year Follow-Up; Lost to Follow-Up Are Considered Alive in ESD Group, Dead in UC Group

Death or Institutionalization

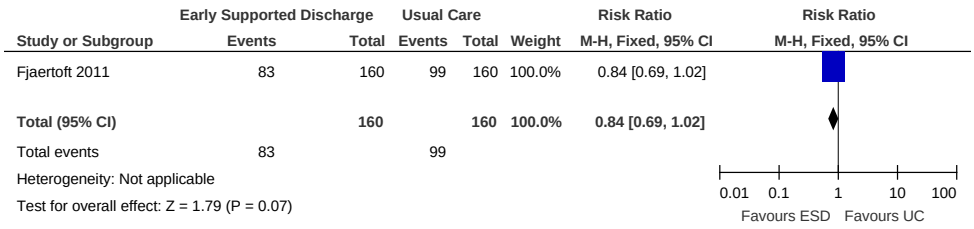
Results of 6 studies (13;14;20-22;25) were combined to derive a pooled estimate of effect, and a random effects model was used to generate an RR summary statistic. Overall, there was no statistically significant difference in death or institutionalization between the ESD group and the UC group (RR, 0.78; 95% CI, 0.58–1.04) (Figure 7). The I^2 value is 32%, indicating no significant heterogeneity among studies. A priori subgroup analyses were not significant except for the service provision of ESD team co-ordination and delivery (RR, 0.66; 95% CI, 0.47–0.94) (Figure 7). The GRADE quality of evidence was assessed as moderate for studies with interventions that had team co-ordination and delivery, moderate for studies with interventions that had only team co-ordination, and low for the single study that had no ESD team. Details of this assessment, including reasons for downgrading the quality of evidence, are reported in Appendix 2.



Abbreviations: CI, confidence interval; ESD, early supported discharge; M-H, Mantel-Haenszel; UC, usual care.

Figure 7: Death or Institutionalization

One study (25) reported 5-year follow-up data for the composite outcome of death or institutionalization in people who received ESD compared with those who received UC (Figure 8). This study used ESD team co-ordination only. In this study status was unknown for 5 patients lost to follow-up in the ESD group and 9 patients lost to follow-up in the UC group. Figure 8 assumes all patients lost to follow-up are either alive or not institutionalized at 5 years. A sensitivity analysis is impossible given the nature of the composite outcome. There was no difference in death or institutionalization between patients receiving ESD and those receiving UC (RR, 0.84; 95% CI, 0.69–1.02) (Figure 8).

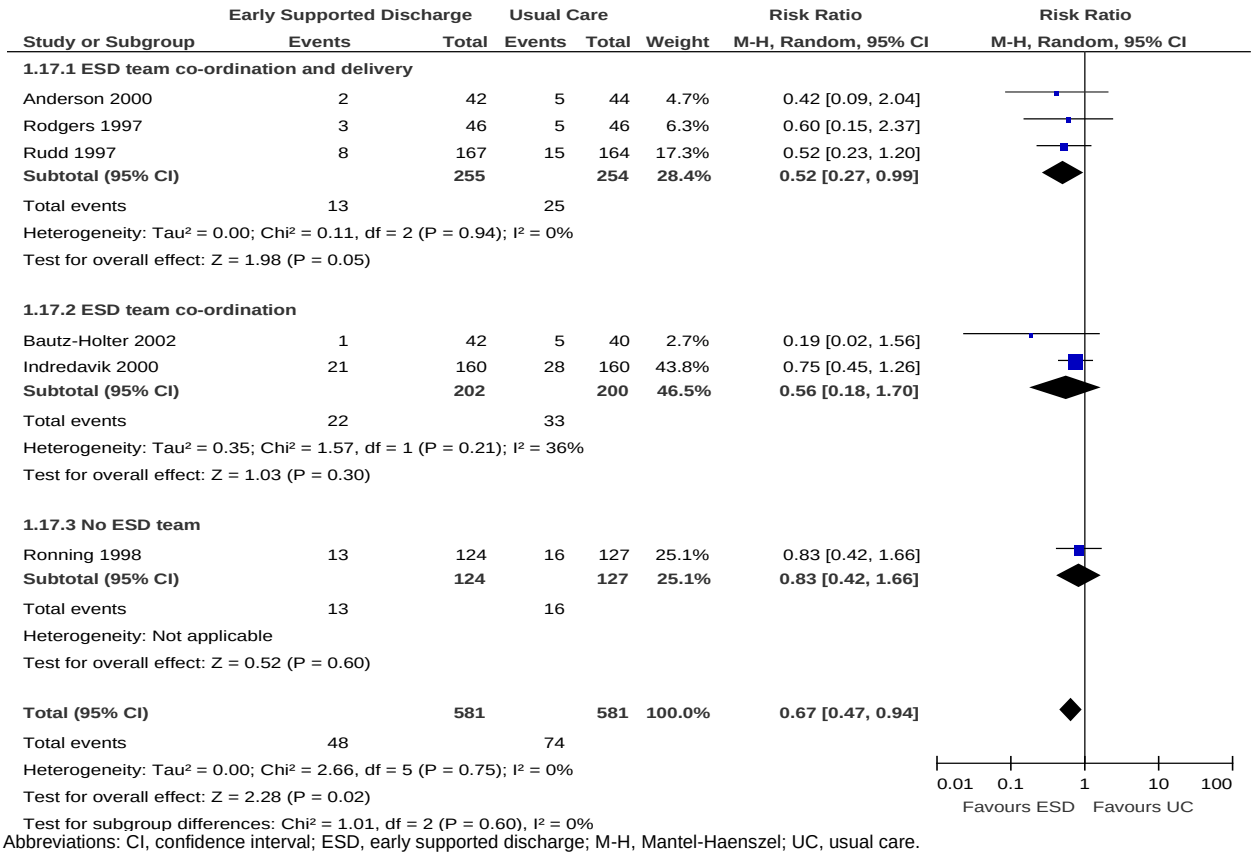


Abbreviations: CI, confidence interval; ESD, early supported discharge; M-H, Mantel-Haenszel; UC, usual care.

Figure 8: Death or Institutionalization at 5-Year Follow-Up

Institutionalization

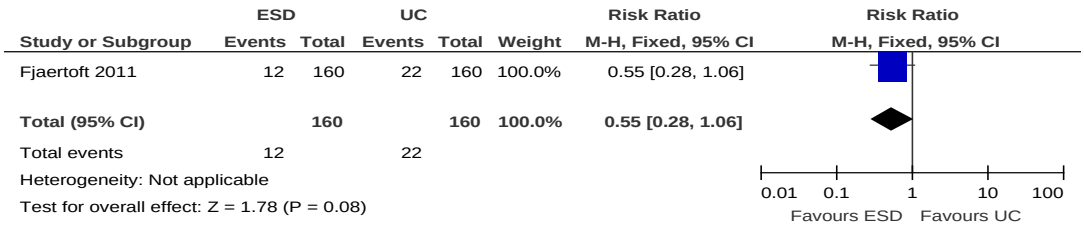
Results of 6 studies (13;14;20-22;25) were combined to derive a pooled estimate of effect, and a random effects model was used to generate an RR summary statistic. There was a difference in institutionalization between the ESD group and the UC group (RR, 0.67; 95% CI, 0.47–0.94) (Figure 9). The I^2 value is 0%, indicating no significant heterogeneity among studies. Results of a priori subgroup analyses were not significant except for the service provision of ESD team co-ordination and delivery (RR, 0.52; 95% CI, 0.27–0.99) (Figure 9). The GRADE quality of evidence was assessed as moderate for studies with interventions that had team co-ordination and delivery, moderate for studies with interventions that had only team co-ordination, and low for the single study that had no ESD team. Details of this assessment, including reasons for downgrading the quality of evidence, are reported in Appendix 2.



Abbreviations: CI, confidence interval; ESD, early supported discharge; M-H, Mantel-Haenszel; UC, usual care.

Figure 9: Institutionalization

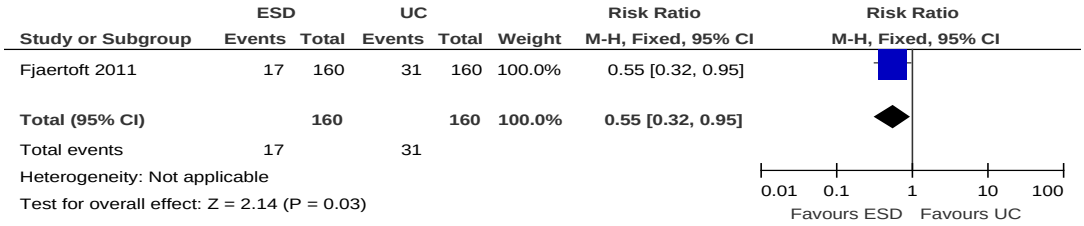
One study (25) reported institutionalization at 5-year follow-up in people receiving ESD team co-ordination only or UC (Figures 3–6). In this study there were 5 patients in the ESD group and 9 in the UC group lost to follow-up. Figure 10 assumes all patients lost to follow-up are not institutionalized at 5 years. There was no difference in institutionalization between people receiving ESD and those receiving UC (RR, 0.55; 95% CI, 0.28–1.06) (Figure 10). A sensitivity analysis was completed assuming different states (institutionalized or not) for those people lost to follow-up (Figures 11–13). There was a difference in rates of institutionalization when all people lost to follow-up were assumed to be institutionalized at 5 years (Figure 11) and also when they were assumed to not be institutionalized in the ESD group and to be institutionalized in the UC group (Figure 13).



Abbreviations: CI, confidence interval; ESD, early supported discharge; M-H, Mantel-Haenszel; UC, usual care.

Figure 10: Institutionalization at 5-Year Follow-Up

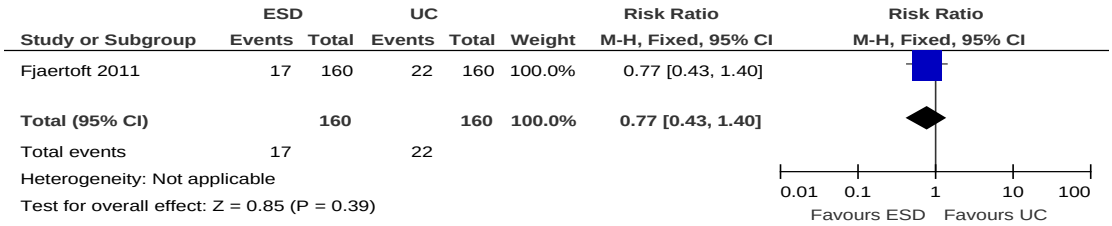
Figure 11 assumes all people lost to follow-up are institutionalized in both groups.



Abbreviations: CI, confidence interval; ESD, early supported discharge; M-H, Mantel-Haenszel; UC, usual care.

Figure 11: Institutionalization at 5-Year Follow-Up; People Lost to Follow-Up Are Considered Institutionalized in Both Groups

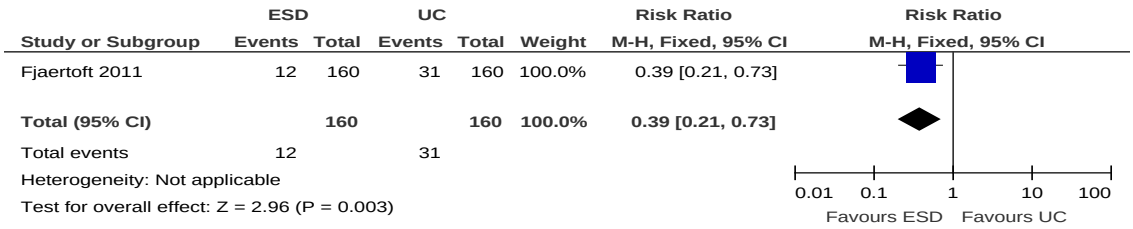
Figure 12 assumes people lost to follow-up are institutionalized in the ESD group and not institutionalized in the UC group.



Abbreviations: CI, confidence interval; ESD, early supported discharge; M-H, Mantel-Haenszel; UC, usual care.

Figure 12: Institutionalization at 5-Year Follow-Up; People Lost to Follow-Up Are Considered Institutionalized in ESD Group, Not Institutionalized in UC Group

Figure 13 assumes people lost to follow-up are not institutionalized in the ESD group and institutionalized in the UC group.

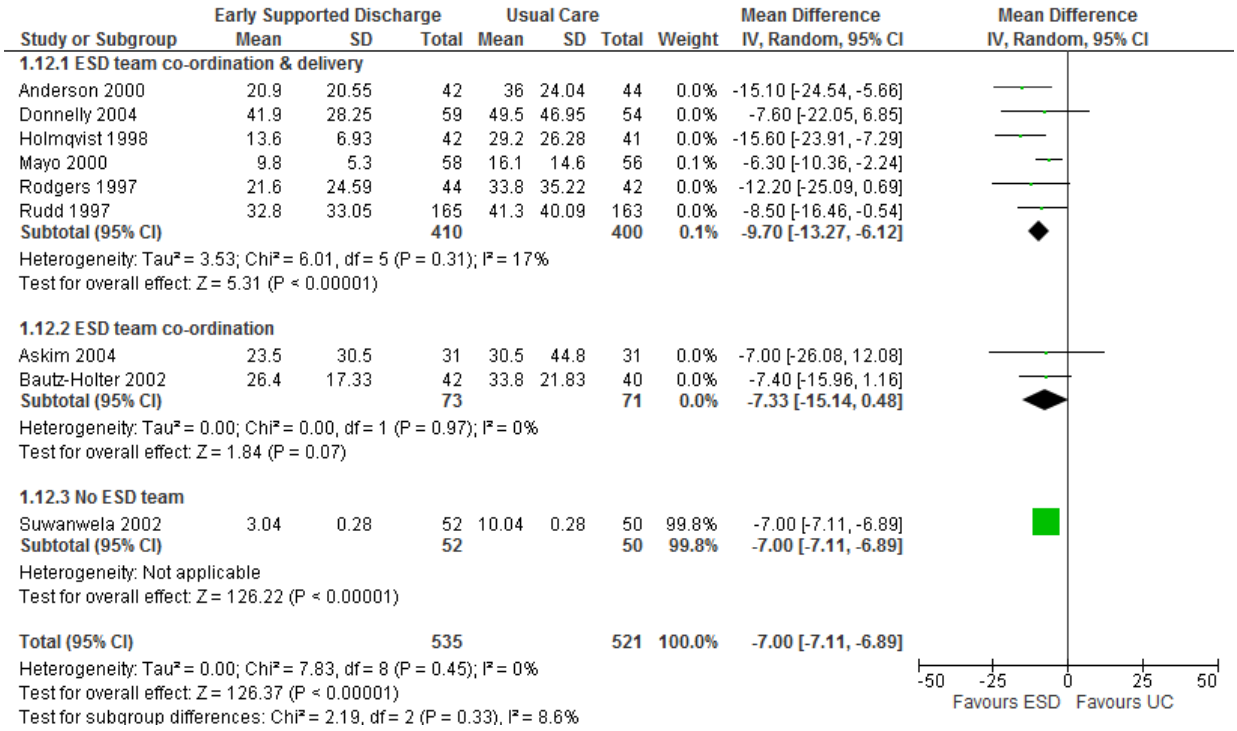


Abbreviations: CI, confidence interval; ESD, early supported discharge; M-H, Mantel-Haenszel; UC, usual care.

Figure 13: Institutionalization at 5-Year Follow-Up; People Lost to Follow-Up Are Considered Not Institutionalized in ESD Group, Institutionalized in UC Group

Length of Stay

Results of 9 studies (13;14;16;17;19;20;22-24) were combined to derive a pooled estimate of effect, and the mean difference was used as the summary statistic. Overall, there was a decrease in the mean length of initial hospital stay of about 8 days (−7.60; 95% CI, −10.48 to −4.72) for the ESD group compared with the UC group (Figure 14). The I^2 value of 63% shows heterogeneity among studies. A priori subgroup analysis indicated that studies with interventions that had the highest level of team co-ordination and delivery experienced a greater decrease in length of hospital stay (−9.63; 95% CI, −15.56 to −3.70) (Figure 14). The GRADE quality of evidence was assessed as moderate for studies with interventions that had team co-ordination and delivery, moderate for studies with interventions that had only team co-ordination, and very low for the single study that had no ESD team. Details of this assessment, including reasons for downgrading the quality of evidence, are reported in Appendix 2.

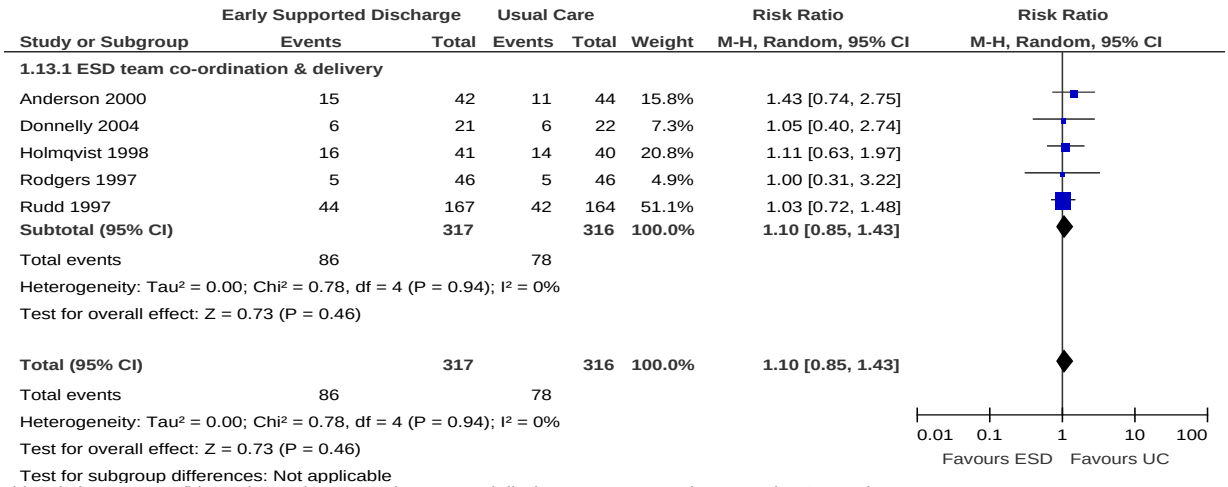


Abbreviations: CI, confidence interval; ESD, early supported discharge; M-H, Mantel-Haenszel; UC, usual care.

Figure 14: Length of Initial Hospital Stay

Readmission to Hospital

Results of 5 studies (13;16;17;20;22) were combined to derive a pooled estimate of effect, and the mean difference was used as the summary statistic. All interventions included ESD team co-ordination and delivery. There was no difference in the number of hospital readmissions between the ESD group and the UC group (RR, 1.10; 95% CI, 0.85–1.43) (Figure 15). The I^2 value of 0% shows no heterogeneity among studies. A subgroup analysis was unnecessary. The GRADE quality of evidence was assessed as low. Details of this assessment, including reasons for downgrading the quality of evidence, are reported in Appendix 2.



Abbreviations: CI, confidence interval; ESD, early supported discharge; M-H, Mantel-Haenszel; UC, usual care.

Figure 15: Readmission to Hospital

Summary of Findings

Table 9: Summary of Findings of Meta-Analyses of Studies Investigating the Effectiveness of ESD Interventions in Patients Hospitalized with Stroke

Outcome	Number of Studies	Number of Participants	Effect Size	GRADE
Death			**RR (95% CI)**	
Overall	11	1619	0.96 (0.65–1.42)	Low
ESD team co-ordination and delivery	6	819	0.69 (0.35–1.34)	Low
ESD team co-ordination	3	447	0.97 (0.56–1.67)	Low
No ESD team	2	353	1.75 (0.90–3.37)	Very low
Death or Institutionalization			**RR (95% CI)**	
Overall	6	1,162	0.78 (0.58–1.04)	Moderate
ESD team co-ordination and delivery	3	509	0.66 (0.47–0.94)	Moderate
ESD team co-ordination	2	402	0.61 (0.27–1.37)	Moderate
No ESD team	1	251	1.21 (0.78–1.87)	Low
Institutionalization			**RR (95% CI)**	
Overall	6	1,162	0.67 (0.47–0.94)	Moderate
ESD team co-ordination and delivery	3	509	0.52 (0.27–0.99)	Moderate
ESD team co-ordination	2	402	0.56 (0.18–1.70)	Moderate
No ESD team	1	251	0.83 (0.42–1.66)	Low
Length of Initial Hospital Stay			**Mean Difference (95% CI)**	
Overall	9	1,056	−7.00 (−7.11 to −6.89)	Moderate
ESD team co-ordination and delivery	6	810	−9.70 (−13.27 to −6.12)	Moderate
ESD team co-ordination	2	144	−7.33 (−15.14 to 0.48)	Moderate
No ESD team	1	102	−7.00 (−7.11 to −6.89)	Very low
Readmission to Hospital			**RR (95% CI)**	
ESD team co-ordination and delivery	5	623	1.10 (0.85–1.43)	Low

Abbreviations: CI, confidence interval; ESD, early supportive discharge; RR, relative risk.

Conclusions

An early supported discharge service is effective in reducing death, institutionalization, and length of hospital stay. In this study, team co-ordination and delivery were found to be the optimal modes of delivery. No difference was found in overall mortality between those patients who received early supported discharge and those who received usual care.

Existing Guidelines for Technology

American Stroke Association

Recommendations from the task force in the context of the rehabilitation of people recovering from stroke include first that stroke patients should be referred to an inpatient facility, an outpatient facility, or a home care service that provides for their medical and functional needs, and second that support systems should be established to ensure that patients discharged from hospitals and other facilities to their homes have appropriate follow-up and primary care arranged on discharge. (3)

Ontario Stroke System

The Consensus Panel on the Stroke Rehabilitation System 2007 recommended that once it is determined that a stroke survivor will benefit from inpatient rehabilitation, the stroke survivor should have access to an interprofessional rehabilitation team with expertise in stroke care. (6) Similarly, stroke survivors who would benefit from community rehabilitation (either home based or ambulatory) should be given access to an interprofessional rehabilitation team with expertise in stroke care. (5)

Canadian Stroke Strategy (*Canadian Best Practice Recommendations for Stroke Care, 2010*)

These guidelines (7), which are a joint initiative of the Canadian Stroke Network and the Heart and Stroke Foundation of Canada, recommend the following with respect to early supported discharge:

- Early supported discharge services provided by well-resourced, co-ordinated specialized interprofessional teams are an acceptable alternative to more prolonged hospital stroke rehabilitation unit care and can reduce the length of hospital stay for some patients.
- Stroke patients with mild to moderate disability can be offered early supported discharge if all of the following criteria are met:
  - They are able to participate in rehabilitation from the date of transfer.
  - They can be safely managed at home.
  - They have access to comprehensive interprofessional community rehabilitation services and caregiver support services.
- Early supported discharge should not be offered to patients with moderately severe to severe stroke.
- To work effectively, early supported discharge services must have elements similar to those of co-ordinated inpatient stroke teams, including the following:
  - a case co-ordination approach;
  - an interprofessional team of specialists in stroke care and rehabilitation working in collaboration with community-based health care professionals;
  - emphasis on client-centred and family-centred practice, setting client goals, and ongoing review of goal attainment;
  - stroke rehabilitation services with intensity established on basis of individual client needs and goals;
  - services that are delivered in the most suitable environment on basis of client issues and strengths;
  - regular team meetings to discuss assessment of new clients, review client management, set goals, and make plans for discharge;

- family meetings to ensure patient and family involvement in management, goal setting, and planning for discharge from the early supported discharge program;
- negotiated withdrawal and discharge from early supported discharge program.

Ontario Stroke Evaluation Report

This report recommends that the Ontario Stroke Network lead the development of province-wide inpatient rehabilitation admission criteria. (5) Inpatient rehabilitation criteria could indirectly shape eligibility criteria for an early supported discharge program.

Further recommendations include the following (5):

- Currently, we are unable to determine community-based rehabilitation services other than those provided by Community Care Access Centres. Outpatient facilities should be surveyed to identify those providing therapies of benefit to stroke patients.
- The National Ambulatory Care Reporting System database maintained by the Canadian Institute for Health Information needs to evolve to capture ambulatory rehabilitation.
- Investment in rehabilitation services at Community Care Access Centres could reduce rates of readmission to hospitals and admission to long-term care institutions.

Acknowledgements

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Appendices

Appendix 1: Literature Search Strategies

Search date: December 16–20, 2011
Databases searched: Ovid MEDLINE, Ovid MEDLINE In-Process and Other Non-Indexed Citations, Ovid Embase, Wiley Cochrane, EBSCO CINAHL, Centre for Reviews and Dissemination

Database: Ovid MEDLINE(R) <1948 to November Week 3 2011>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <December 08, 2011>, Embase <1980 to 2011 Week 49>
Search Strategy:
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1 exp Stroke/ or exp brain ischemia/ (273819)
2 exp intracranial hemorrhages/ use mesz (50434)
3 exp brain hemorrhage/ use emez (66379)
4 exp stroke patient/ use emez (5358)
5 (stroke or tia or transient ischemic attack or cerebrovascular apoplexy or cerebrovascular accident or cerebrovascular infarct* or brain infarct* or CVA or brain ajd2 isch?emia or (cerebral adj2 isch?emia) or (intracranial adj2 hemorrhag*) or (brain adj2 hemorrhag*)).ti,ab. (320578)
6 or/1-5 (510466)
7 exp Patient Discharge/ use mesz (16165)
8 exp hospital discharge/ use emez (47519)
9 ((post-discharge or postdischarge or discharge) adj2 (early or facilitated or support* or service* or plan* or summar* or coordinat* or co-ordinat* or manage*)).ti,ab. (13503)
10 esd.ti,ab. (3799)
11 or/7-10 (74415)
12 6 and 11 (4646)
13 limit 12 to english language (4305)
14 limit 13 to yr="2011 -Current" (458)
15 limit 14 to (case reports or comment or editorial or letter or note) [Limit not valid in Ovid MEDLINE(R), Ovid MEDLINE(R) In-Process,Embase; records were retained] (24)
16 Case Report/ use emez (1754749)
17 14 not (15 or 16) (406)
18 remove duplicates from 17 (364)

Cumulative Index to Nursing & Allied Health Literature

#	Query	Results
S10	S6 and S9 Limiters - Published Date from: 20110101-20121231; English Language	157
S9	S7 OR S8	26716
S8	TI (post-discharge or postdischarge or discharge or esd) or AB (post-discharge or postdischarge or discharge or esd)	19223
S7	(MH "Patient Discharge+")	12788
S6	S1 OR S2 OR S3 OR S4 OR S5	42619
S5	(MH "Stroke Patients")	1824
S4	stroke or tia or transient ischemic attack or cerebrovascular apoplexy or cerebrovascular accident or cerebrovascular infarct* or brain infarct* or CVA or brain N2 isch?emia or cerebral N2 isch?emia or intracranial N2 hemorrhag* or brain N2 hemorrhag*	38178
S3	(MH "Intracranial Hemorrhage+")	4612
S2	(MH "Cerebral Ischemia+")	5343
S1	(MH "Stroke")	24849

Centre for Reviews and Dissemination

Line	Search	Hits
1	MeSH DESCRIPTOR stroke EXPLODE ALL TREES	549
2	MeSH DESCRIPTOR brain ischemia EXPLODE ALL TREES	144
3	MeSH DESCRIPTOR intracranial hemorrhages EXPLODE ALL TREES	116
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5	#1 OR #2 OR #3 OR #4	2202
6	MeSH DESCRIPTOR Patient Discharge EXPLODE ALL TREES	146
7	(((post-discharge or postdischarge or discharge) adj2 (early or facilitated or support* or service* or plan* or summar* or coordinat* or co-ordinat* or manage*)))	128
8	(esd)	9
9	#6 OR #7 OR #8	246
10	#5 AND #9	35
11	(#10) FROM 2011 TO 2011	1

Cochrane Library

ID	Search	Hits
#1	MeSH descriptor **Stroke** explode all trees	3791
#2	MeSH descriptor **Brain Ischemia** explode all trees	1865
#3	MeSH descriptor **Intracranial Hemorrhages** explode all trees	1080
#4	(stroke or tia or transient ischemic attack or cerebrovascular apoplexy or cerebrovascular accident or cerebrovascular infarct* or brain infarct* or CVA or (brain NEAR/2 isch?emia) or (cerebral NEAR/2 isch?emia) or (intracranial NEAR/2 hemorrhag*) or (brain NEAR/2 hemorrhag*)):ti or (stroke or tia or transient ischemic attack or cerebrovascular apoplexy or cerebrovascular accident or cerebrovascular infarct* or brain infarct* or CVA or (brain NEAR/2 isch?emia) or (cerebral NEAR/2 isch?emia) or (intracranial NEAR/2 hemorrhag*) or (brain NEAR/2 hemorrhag*)):ab	15917
#5	(#1 OR #2 OR #3 OR #4)	17549
#6	MeSH descriptor **Patient Discharge** explode all trees	844
#7	((post-discharge or postdischarge or discharge) NEAR/2 (early or facilitated or support* or service* or plan* or summar* or coordinat* or co-ordinat* or manage*))	1269
#8	(esd)	62
#9	(#6 OR #7 OR #8)	1860
#10	(#5 AND #9), in 2011	7

Appendix 2: GRADE Profiles

Table A1: GRADE Evidence Profile for Comparison of Early Supported Discharge and Usual Care

No. of Studies (Design)	Risk of Bias	Inconsistency	Indirectness	Imprecision	Publication Bias	Upgrade Considerations	Quality
Outcome A							
5 (RCTs) 4 (observational)	No serious limitations Serious limitations (−1) [a] Very serious limitations (−2) [a]	No serious limitations Serious limitations (−1) [a] Very serious limitations (−2) [a]	No serious limitations Serious limitations (−1) [a] Very serious limitations (−2) [a]	No serious limitations Serious limitations (−1) [a] Very serious limitations (−2) [a]	Undetected Likely (−1) [a] Very likely (−2) [a]	Large magnitude of effect (+1) Dose-response gradient (+1) All plausible confounding increases confidence in estimate (+1) Other considerations (+1)	⊕⊕⊕⊕ High ⊕⊕⊕ Moderate ⊕⊕ Low ⊕ Very low
Death							
11 RCTs [a] 6 RCTs [d] 3 RCTs [e] 2 RCTs [b]	No serious limitations No serious limitations No serious limitations Serious limitations(−1) [g]	Serious limitations (−1) [b] Serious limitations (−1) [b] Serious limitations (−1) [b] Serious limitations (−1) [b]	No serious limitations No serious limitations No serious limitations No serious limitations	Serious limitations (−1) [c] Serious limitations (−1) [c] Serious limitations (−1) [c]Serious limitations (−1) [c]	Undetected Undetected Undetected Likely [h]	None applicable None applicable None applicable None applicable	⊕⊕ Low ⊕⊕ Low ⊕⊕ Low ⊕ Very low
Death or Institutionalization							
6 RCTs [a] 3 RCTs [d] 2 RCTs [e] 1 RCT [b]	No serious limitations No serious limitations No serious limitations No serious limitations	No serious limitations No serious limitations No serious limitations Not applicable [i]	No serious limitations No serious limitations No serious limitations No serious limitations	Serious limitations (−1) [c] Serious limitations (−1) [i] Serious limitations (−1) [c] Serious limitations (−1) [c]	Undetected Undetected Undetected Likely (−1) [j]	None applicable None applicable None applicable None applicable	⊕⊕⊕ Moderate ⊕⊕⊕ Moderate ⊕⊕⊕ Moderate ⊕⊕ Low
Institutionalization							
6 RCTs [a] 3 RCTs [d] 2 RCTs [e] 1 RCT [b]	No serious limitations No serious limitations No serious limitations No serious limitations	No serious limitations No serious limitations No serious limitations Not applicable [j]	No serious limitations No serious limitations No serious limitations No serious limitations	Serious imprecision (-1) [k] Serious imprecision (-1) [m] Serious imprecision (-1) [c] Serious limitations (-1) [c]	Likely [h] Undetected Undetected Likely (−1) [j]	None applicable None applicable None applicable None applicable	⊕⊕⊕ Moderate ⊕⊕⊕ Moderate ⊕⊕⊕ Moderate ⊕⊕ Low

Length of Initial Hospital Stay							
9 RCTs [a]	Serious limitations (−1) [n]	Serious limitations [o]	No serious limitations	No serious limitations	Undetected	None applicable	⊕⊕⊕ Moderate
6 RCTs [d]	Serious limitations (−1) [n]	serious limitations [p]	No serious limitations	No serious limitations	Undetected	None applicable	⊕⊕⊕ Moderate
2 RCTs [e]	No serious limitations	No serious limitations	No serious limitations	No serious limitations	Undetected	None applicable	⊕⊕⊕ Moderate
1 RCT [b]	Serious limitations (−1) [s]	Not applicable [j]	Serious limitations (−1) [r]	Serious limitations (−1) [q]	Likely (−1) [j]	None applicable	⊕ Very low
				No serious limitations			
Readmission to Hospital							
5 RCTs [d]	Serious limitations (−1) [t]	No serious limitations	No serious limitations	Serious limitations (−1) [c]	Undetected	None applicable	⊕⊕ Low

Abbreviations: ESD, early supported discharge; GRADE, Grading of Recommendations Assessment, Development and Evaluation ; No., number; RCT, randomized controlled trial; UC, usual care.

[a] Overall (includes all studies). [b] Point estimates vary widely among studies. [c] Optimal information size criterion (presented as number of events) not met and 95% confidence interval includes appreciable benefit or harm. (26) [d] ESD team co-ordination and delivery. [e] ESD team co-ordination. [f] No ESD team; [g] Unclear allocation concealment methods in study by Suwanwela et al, which represents 50% of the body of evidence for this subgroup (23). [l] test for heterogeneity $P = 0.20$ indicates heterogeneity $I^2 = 32\%$; optimal information size for total number of events is estimated at greater than 250 but less than 300; observed number of events is 255. Therefore this was not downgraded. [i] Optimal information size not met (optimal number of events is 200 based on an alpha of 0.05 and power of 80%); the observed number of events in this subgroup analysis is 105 with an UC event rate of 24% and relative risk reduction of 34%. (23;26) [j] One study. [k] Optimal information size not met (optimal number of events is approximately 250 based on an alpha of 0.05 and power of 80% and an UC event rate of 13%); observed number of events is 122 with an UC event rate of 13% and relative risk reduction of 33%. (23;26) [h] Skewed funnel plot but not downgraded as result; should be interpreted with caution. [m] Optimal information size not met (optimal number of events is approximately 100 based on an alpha of 0.05 and power of 80% and UC group rate of 10%); observed number of events is 38 with an UC event rate of 10% and relative risk reduction of 48%. (23;26);[n] One third of studies in body of evidence have unclear methods for allocation concealment and outcome assessors blinding to treatment group. [o] I^2=63%, statistical test for heterogeneity shows a low *P*-value (*P*=0.005) indicating large heterogeneity among studies; however, when results of Mayo et al (19) are removed, I^2=9% and *P*=0.36; therefore criterion not downgraded. [p] Large inconsistency in study results remains in subgroup I^2=70% and test for heterogeneity shows a low *P*-value (*P*=0.005); however, when results of Mayo et al (19) are removed, I^2=0% and *P*=0.69; therefore, criterion not downgraded. [q] Optimal information size not met. [r] Population from Thailand. [s] Allocation concealment not reported and blinding methodology unclear. [t] 40% of body of evidence has unclear allocation concealment and methods.

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