

Self-Management and Educational Interventions in the Postacute Stroke Population: A Rapid Review

C Kabali

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Evidence Development and Standards Branch at 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.

Rapid Review Methodology

Rapid reviews must be completed in a 2- to 4-week time frame. Clinical questions are developed by the Evidence Development and Standards branch at Health Quality Ontario, in consultation with experts, end users, and/or applicants in the topic area. A systematic literature search is then conducted to identify relevant systematic reviews, health technology assessments, and meta-analyses. The methods prioritize systematic reviews, which, if found, are rated by AMSTAR to determine the methodological quality of the review. If the systematic review has evaluated the included primary studies using the GRADE Working Group criteria (<http://www.gradeworkinggroup.org/index.htm>), the results are reported and the rapid review process is complete. If the systematic review has not evaluated the primary studies using GRADE, the primary studies in the systematic review are retrieved and the GRADE criteria are applied to 2 outcomes. If no systematic review is found, then RCTs or observational studies are included, and their risk of bias is assessed. All rapid reviews are developed and finalized in consultation with experts.

About Health Quality Ontario

Health Quality Ontario is an arms-length agency of the Ontario government. It is a partner and leader in transforming Ontario's health care system so that it can deliver a better experience of care, better outcomes for Ontarians, and better value for money.

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.

Based on the evidence provided by Evidence Development and Standards and its partners, the Ontario Health Technology Advisory Committee—a standing advisory subcommittee of the Health Quality Ontario Board—makes recommendations about the uptake, diffusion, distribution, or removal of health interventions to Ontario's Ministry of Health and Long-Term Care, clinicians, health system leaders, and policy-makers.

Health Quality Ontario's research is published as part of the *Ontario Health Technology Assessment Series*, which is indexed in MEDLINE/PubMed, Excerpta Medica/Embase, and the Centre for Reviews and Dissemination database. Corresponding Ontario Health Technology Advisory Committee recommendations and other associated reports are also published on the Health Quality Ontario website. Visit <http://www.hqontario.ca> for more information.

About Health Quality Ontario Publications

To conduct its rapid reviews, the Evidence Development and Standards branch and its research partners review the available scientific literature, making every effort to consider all relevant national and international research; collaborate with partners across relevant government branches; consult with expert advisory panels, clinical and other external experts, and developers of health technologies; and solicit any necessary supplemental information.

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 rapid review is the work of the Evidence Development and Standards branch at Health Quality Ontario, and is developed from analysis, interpretation, and comparison of published scientific research. It also incorporates, when available, Ontario data and information provided by experts. As this is a rapid review, it may not reflect all the available scientific research and is not intended as an exhaustive analysis. Health Quality Ontario assumes no responsibility for omissions or incomplete analysis resulting from its rapid reviews. In addition, it is possible that other relevant scientific findings may have been reported since completion of the review. This report is current as of the date of the literature search specified in the Research Methods section. Health Quality Ontario makes no representation that the literature search captured every publication that was or could be applicable to the subject matter of the report. This rapid review 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>.

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List of Abbreviations

AACPDM	American Academy for Cerebral Palsy and Developmental Medicine
ADL	Activities of daily living
AMSTAR	Assessment of Multiple Systematic Reviews
CHF	Congestive heart failure
CI	Confidence interval
COPD	Chronic obstructive pulmonary disease
GRADE	Grading of Recommendations Assessment, Development and Evaluation
HRQoL	Health-related quality of life
MD	Mean difference
OR	Odds ratio
RCT	Randomized controlled trial
RD	Risk difference
SF	Short form
SGRQ	St. George Respiratory Questionnaire
SR	Systematic review

Background

As legislated in Ontario's *Excellent Care for All Act*, Health Quality Ontario's mandate includes the provision of objective, evidence-informed advice about health care funding mechanisms, incentives, and opportunities to improve quality and efficiency in the health care system. As part of its Quality-Based Procedures (QBP) initiative, Health Quality Ontario works with multidisciplinary expert panels (composed of leading clinicians, scientists, and administrators) to develop evidence-based practice recommendations and define episodes of care for selected disease areas or procedures. Health Quality Ontario's recommendations are intended to inform the Ministry of Health and Long-Term Care's Health System Funding Strategy.

For more information on Health Quality Ontario's Quality-Based Procedures initiative, visit www.hqontario.ca.

Objective of Analysis

The objective of this rapid review is to evaluate whether community-based self-management or educational programs for post-acute stroke, congestive heart failure (CHF), and chronic obstructive pulmonary disease (COPD) improve activity of daily living (ADL), reduce hospital admissions, or improve patients' health-related quality of life (HRQoL).

Clinical Need and Target Population

Stroke, CHF, and COPD are among the major causes of hospitalization in Ontario. Stroke is the third leading cause of death in Canada, (1;2) with about 50,000 stroke cases occurring annually. The burden of stroke in the Canadian economy is estimated at \$3.6 billion a year. (3) The number of Canadians living with CHF is estimated at 500,000 (4). Depending on the severity of symptoms and other complications, CHF can be associated with an annual mortality rate of 5% to 50%. (5) COPD is Canada's fourth leading cause of death and is growing in prevalence. An estimated 772,200 Canadians aged 35 years and above are living with COPD. (3) COPD accounts for the highest rates of hospital admissions among major chronic diseases in Canada.

The burden of stroke, CHF, and COPD highlight the importance of identifying effective evidence-based intervention practices that reflect the best patient care and local population needs. The patient's education is an essential component of post-acute care. It promotes disease awareness and self-management, which empower patients to manage aspects of their daily lives independently. This in turn can improve the cost-effectiveness of the health care system. International guidelines on the management of post-acute care in the community acknowledge the need for patient-centred education to facilitate the rehabilitation process; however, none of the recommendations provide any specifics on the types and levels of interventions that are more likely to optimize patients' health and quality of life. To address the problem, we reviewed the current evidence to determine the effectiveness of self-management or educational programs on HRQoL, ADL, and hospital admissions for the post-acute population residing in the community.

Rapid Review

Research Question

What is the impact of self-management or educational interventions on HRQoL, ADL, and hospital admissions for the post-acute stroke, CHF, and COPD patients in the community?

Research Methods

Literature Search

A literature search was performed on December 5, 2013, using Ovid MEDLINE, Ovid MEDLINE In-Process and Other Non-Indexed Citations, the Wiley Cochrane Library, and the Centre for Reviews and Dissemination database, for studies published from January 1, 2008, until December 5, 2013. 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

- English-language full reports
- Published between January 1, 2008, and December 5, 2013
- Health technology assessments, systematic reviews (SRs), and meta-analyses
- Stroke, CHF, and COPD post-acute patients in the community
- Studies reporting a measure of quality of life, ADL, and hospital admissions

Exclusion Criteria

- Primary studies (randomized controlled trials [RCTs], observational studies, case series, etc.)
- Children (patients < 18 years)
- Acute stroke, CHF, and COPD not yet discharged into the community
- Studies where outcomes of interest cannot be extracted

Outcomes of Interest

- Hospital admissions
- HRQoL
- ADL

Expert Panel

In November 2013, an Expert Advisory Panel on Post-Acute Community-Based Care for Stroke Patients was struck. Members of the panel included physicians, nurses, allied health professionals, and personnel from the Ministry of Health and Long-Term Care.

The role of the expert advisory panel was to provide advice on primary stroke patient groupings; to review the evidence, guidance, and publications related to defined stroke patient populations; to identify

and prioritize interventions and areas of community-based care; to advise on the development of a care pathway model; and to develop recommendations to inform funding mechanisms. The role of panel members was to provide advice on the scope of the project, the methods used, and the findings. However, the statements, conclusions, and views expressed in this report do not necessarily represent the views of the expert panel members.

Quality of Evidence

The Assessment of Multiple Systematic Reviews (AMSTAR) tool was used to assess the quality of the final selection of the SR. (6) Details on the outcomes of interest were abstracted from the selected review, and primary studies were referenced as needed.

The quality of the body of evidence for each outcome was examined according to the GRADE Working Group criteria. (7) The overall quality was determined to be very low, low, moderate, or high using a step-wise, structural method.

Study design was the first consideration; the starting assumption was that RCTs are high quality, whereas observational studies are low quality. Five additional factors—risk of bias, inconsistency, indirectness, imprecision, and publication bias—were then taken into account. Limitations in these areas resulted in downgrading the quality of evidence. Finally, 3 main factors that may raise the quality of evidence were considered: the large magnitude of effect, the dose response gradient, and any residual confounding factors. (7) For more detailed information, please refer to the latest series of GRADE articles. (7)

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 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 could 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 Rapid Review

The database search yielded 207 citations published between January 1, 2008, and December 05, 2013 (with duplicates removed). Articles were excluded on the basis of information in the title and abstract. The full texts of potentially relevant articles were obtained for further assessment.

Fifteen SRs met the criteria for HRQoL (n = 15), ADL (n = 1), and hospital admissions (n = 8). These were then grouped by intervention (generic or self-management) and outcome (HRQoL, ADL, or hospital admissions). Within each category, the SR with the highest AMSTAR score was selected for review. Nine SRs with low AMSTAR score were excluded from further review. Thus, 6 SRs qualified for this review. The AMSTAR ratings are shown in Appendix 2, Table A1. Table 1 gives a summary of the selected SRs.

Table 1: Summary of Systematic Reviews Included

Author, Year	Review Type	Type of illness	Search Dates	Inclusion Criteria	No. of Studies	AMSTAR Score
Forster et al, 2012 (2) ¹	SR	Stroke	To July 2012	RCTs Patients with a clinical diagnosis of stroke TIA.	13	9
Lennon et al, 2013 (8) ¹	SR	Stroke	To October 2012	RCTs Studies including self-management programs delivered to stroke participants aged ≥18 years.	8	7
Ditewig et al, 2010 (9)	SR	CHF	To April 2009	RCTs Studies including self-management programs delivered to CHF participants aged ≥18 years.	14	8
Wakefield et al, 2013 (10)	SR	CHF	To December 2008	RCTs	20	8
Tan et al, 2012 (11)	SR	COPD	To October 2011	RCTs Age ≥60 years No participation in a pulmonary rehabilitation program or other exercise training program Intervention for ≥3 months	10	9
Effing et al, 2007 (12) ²	SR	COPD	To January 2006	RCT	13	8

Abbreviations: AMSTAR, Assessment of Multiple Systematic Reviews; SR, systematic review; TIA, transient ischemic attack.

¹Only outcomes that are relevant to this review are included.

²One primary study was not randomized and is excluded.

Results by Type of Illness

Stroke

The database search yielded 2 SRs meeting inclusion criteria that reported on HRQoL for community-dwelling, post-acute stroke patients receiving self-management or educational programs. Both SRs received high AMSTAR scores (Appendix 2, Table A1), have recent publication dates, were addressing slightly different types of interventions (generic vs. self-management education), and have a very minor overlap in the primary studies captured. They are described below.

Forster et al (2) examined the effectiveness of information provision strategies on various outcomes and found no evidence of the effect of patient's information provision on either HRQoL or ADL. No assessment on hospital admissions was done. The SR captures 5 RCTs that examined the effectiveness of HRQoL, and 8 RCTs that assessed ADL. The duration of follow-up for HRQoL and ADL ranged from 1 to 5 months and 3 to 19 months, respectively. The RCTs differed on the mode (oral training or written package) and intensity (passive information or active information) of intervention delivery, choice of the control group (conventional education or no education), HRQoL measurement tools (Dartmouth COOP Charts, EuroQol, Short Form [SF]-36, or the Functional Limitations Profile), and ADL measurements (Barthel index or Frenchay activities index). As a result, the individual studies could not be meta-analysed. The methodological quality of individual RCTs were rated on the GRADE scale. Both outcomes received a low GRADE quality of evidence (Appendix 2, Table A2).

Lennon et al (8) examined the effect of self-management intervention on several outcomes. Mixed results were reported on the efficacy of self-management programs on HRQoL. A protective effect in favor of intervention was reported in 5 out of 8 RCTs. The RCTs adopted different tools to assess HRQoL, which included stroke specific HRQoL scale, SF-36, and a stroke impact scale. No assessment was done on ADL or hospital admissions. The follow-up period ranged from approximately 24 days to over 4 years. The types and intensity of intervention also varied across RCTs, with the duration of intervention ranging from 6 weeks to 6 months. Because of substantial heterogeneity across studies, no meta-analysis was performed. The methodological quality of the individual trials were rated using the tool developed by the AACPDm, which assessed the following domains on a scale of 1 to 7: inclusion criteria, description of and adherence to intervention, accuracy of measurements, blinded assessors, the conduct and reporting of appropriate statistical evaluations, non-differential dropout rate $\leq 20\%$, and control for sources of biases. Since the SR did not assess the GRADE level of evidence, the risk of bias assessment from AACPDm criteria for each RCT reported by Lennon et al (8) was used to determine the GRADE for each of the individual studies. Both outcomes received a moderate GRADE quality of evidence (Appendix 2, Table A2).

Limitations

Considerable variation in intervention strategies and definition of the control group was observed across a range of individual RCTs in both SRs. Because the effectiveness of education and self-management programs depends on the interaction of components within the intervention bundle and on what is defined as usual care, it is difficult to determine from existing literature which intervention packages would be appropriate for Ontario.

CHF

The database search yielded 2 SRs for CHF review. Ditewig et al (9) examined the effectiveness of self-management interventions on HRQoL and CHF hospital admissions, along with other outcomes that are not the focus of this review. No assessment on ADL was done. Of the four RCTs that evaluated the

effectiveness of self-management programs on CHF-specific hospital readmissions, 2 reported significant reduction in favor of intervention, while the remaining 2 found a non-significant reduction. The follow-up ranged from 3 to 16 months. For the studies that found a statistically significant reduction, the reported effect measures were a risk difference (RD) of -0.19 (95% confidence interval [CI], -0.29 to -0.09 , $P < 0.0001$) and a relative risk of 0.49 (95% CI, 0.31 to 0.76). For those reporting a non-significant reduction, the effect measures were 3- and 6-month relative risk reductions of -36% ($P = 0.06$) and -35.9% ($P = 0.06$), respectively, and an odds ratio (OR) of 0.58 (95% CI, 0.21 to 1.56). Fourteen RCTs evaluated the effectiveness of self-management programs on HRQoL, but found inconsistent results. Eleven RCTs used disease-specific Minnesota Living with Heart Failure Questionnaire (MLWHFQ) to measure HRQoL. Of these, 4 showed significant improvement on MLWHFQ in favor of intervention. Of the 5 RCTs that applied the generic SF-36 to measure HRQoL, 4 reported a protective effect in favor of intervention, while 1 study reported a null effect. One RCT used SF-12 to measure HRQoL and reported a significant improvement in HRQoL in the physical functioning domain after 6 months of intervention. However, the effect disappeared after 1 year of follow-up. Another RCT evaluated the effectiveness of HRQoL using a disease-specific questionnaire, a generic questionnaire, and a patient global self-assessment. In all 3 measurements, HRQoL did not differ between the intervention and the control group. One RCT measured HRQoL using the Kansas City Cardiomyopathy questionnaire, containing 5 domains. A significant improvement in favor of intervention was reported on HRQoL, physical impairment symptoms, understanding and self-efficacy, and psychosocial impact. It should be noted that multiple tools for measuring HRQoL were applied in some RCTs. Because of substantial heterogeneity on the range of interventions (and controls), no meta-analysis was done.

The methodological quality of this SR was evaluated using the Delphi list of RCTs, which assessed the following 8 domains: treatment allocation, similarity on baseline characteristics, specification of eligibility criteria, blinded assessor, blinded provider, blinded patient, presentation of point estimates and measures of variability, and intention-to-treat analysis. Since the SR used a tool other than GRADE to determine the level of evidence, the risk of bias assessment from the Delphi list of each RCT reported by Ditewig et al (9) was used for GRADE evaluation of individual studies. Both outcomes received a moderate GRADE quality of evidence (Appendix 2, Table A2).

Wakefield et al (10) assessed the effectiveness of multicomponent programs, including the effectiveness of patient education on hospital readmission, CHF specific HRQoL, and other outcomes that are not part of this review. No assessment on ADL was done. Seventeen individual RCTs evaluated the effectiveness of patient education on hospital readmissions. Intervention strategies varied noticeably across studies. Nevertheless, results from these RCTs were pooled for meta-analysis, possibly reflecting the fact that the authors' interest was to examine the generic effect of patient education regardless of the mechanisms of delivery. Readmission rates were significantly lower in intervention subjects than control subjects (pooled RD -0.16 ; 95% CI, -0.02 to -0.07 , $P < 0.01$, P -heterogeneity = 0.405). Twenty RCTs evaluated the impact of patient education on HRQoL. HRQoL was found to be significantly better in the intervention group than in control (pooled mean difference [MD] 0.23 ; 95% CI, 0.06 to 0.40 , $P = 0.007$, P -heterogeneity < 0.001). There was no quantitative description on the extent of heterogeneity for studies examining HRQoL. The duration of intervention for both outcomes ranged from 6 weeks to 1 year.

There was no indication that a standard procedure was used to assess the methodological quality of individual RCTs. As a result, GRADE evaluation had to be performed for this review by extracting all the relevant literature cited in the SR. After evaluating all individual RCTs, both outcomes received a moderate GRADE quality of evidence (Appendix 2, Table A2).

Limitations

Some limitations were noted. The interventions were administered as a bundle with varying ingredients, intensity, and duration. It is thus uncertain which ingredients are more likely to optimize patients' outcomes. Interventions in some of the RCTs were poorly described, making it difficult to perform any replication. Finally, imbalance in prognostic factors was noted in some RCTs, leaving room for bias.

COPD

The database search yielded 2 SRs for COPD review.

Tan et al (11) evaluated the effectiveness of educational programs on HRQoL, COPD-related hospital admissions, and other outcomes that are not the focus of this review. No assessment on ADL was done. The HRQoL was measured using St. George Respiratory Questionnaire (SGRQ). Nine RCTs reported SGRQ scores. The follow-up period for the SGRQ outcome ranged from 6 months to 1 year. The SGRQ score was lower (indicating a higher HRQoL) in the intervention group than the usual care. A 6-month follow-up pooled MD was -2.76 (95% CI, -6.22 to 0.69, P-heterogeneity = 0.13, $I^2 = 52\%$). A 1 year follow-up pooled MD was -1.78 (95% CI, -4.49 to 0.93, P-heterogeneity 0.96, $I^2 = 0$). Five RCTs reported COPD-related hospital admissions. Of these, 4 qualified for meta-analysis. The follow-up period was one year. There was a significant reduction in hospital admissions in the intervention group compared to usual care (pooled OR 0.55, 95% CI, 0.43 to 0.71, P-heterogeneity = 0.65, $I^2 = 0\%$).

The quality of evidence was rated using the Cochrane Handbook for Systematic Reviews of Intervention. Both outcomes received a moderate GRADE quality of evidence (Appendix 2, Table A2).

Effing et al (12) evaluated the effectiveness of self-management programs on HRQoL, hospital admissions, and other end points that are not the focus of this review. No assessment on ADL was done. Seven studies reporting HRQoL outcome were pooled for meta-analysis. The follow-up period ranged from 2 months to 2 years. The HRQoL was measured using SGRQ. The total SGRQ in the self-management group was lower (indicating a higher HRQoL) than in the usual care (pooled MD -2.58; 95% CI, -5.14 to -0.02, P-heterogeneity=0.58, $I^2=0\%$). Of the 10 studies reporting COPD-related hospital admissions, 7 were included for meta-analysis. There was a significant reduction in hospital admissions for patients receiving self-management education compared with usual care (pooled OR 0.64, 95% CI, 0.47 to 0.89, P-heterogeneity=0.74, $I^2=0\%$).

Both outcomes received a moderate GRADE quality of evidence (Appendix 2, Table A2).

Limitations

Although both SRs were published recently, there was a remarkable variation in the period in which the individual RCTs were conducted, with some dating as far back as 20 years. Therefore, caution should be taken to ensure that the adopted educational programs are structured to reflect the current practice and technology.

Conclusions

On the basis of 6 SRs evaluating the effectiveness of educational or self-management programs, the following conclusions were reached:

- Low quality of evidence indicates that a patient's information provision has no impact on HRQoL or ADL among stroke patients.
- Moderate quality of evidence shows that the majority of RCTs (5 of 8) were in favor of self-management programs in relation to HRQoL among stroke patients, although findings were mixed.
- Moderate quality of evidence supports the hypothesis that self-management programs reduce hospital admissions and increase HRQoL among CHF patients.
- Moderate quality of evidence supports the hypothesis that general patient educational programs reduce hospital admissions and improve HRQoL in CHF patients.
- Moderate quality of evidence indicates that general patient educational programs reduce hospital admissions and improve HRQoL in COPD patients.
- Moderate quality of evidence indicates that self-management programs reduce hospital admissions and improve HRQoL in COPD patients.

Acknowledgements

Editorial Staff

Timothy Maguire

Medical Information Services

Corinne Holubowich, BEd, MLIS

Kellee Kaulback, BA(H), MIST

Health Quality Ontario Expert Advisory Panel on Post-Acute, Community-Based Care for Stroke Patients

Name	Affiliation(s)	Appointment(s)
Panel Co-Chairs		
Dr Mark Bayley	Toronto Rehabilitation Institute; University of Toronto	Medical Director of the Neuro-rehabilitation Program; Associate Professor
Karyn Lumsden	Central West Community Care Access Centre (CCAC)	Vice President of Client Services
Neurology		
Dr Leanne Casaubon	Toronto Western Hospital; University of Toronto	Assistant Professor-Division of Neurology, Stroke Program
Physical Medicine and Rehabilitation		
Dr Robert Teasell	Stroke Rehabilitation Program at Parkwood Hospital; Western University	Medical Director; Professor
Family Medicine		
Dr Adam Stacy	Ontario Medical Association	Board Member
Nursing		
Connie McCallum	Niagara Health System	Nurse Practitioner, TIA/Stroke Prevention Clinic
Trixie Williams	Central East LHIN	Lead, Vascular Health
Arms Armesto	Sunnybrook Health Sciences Centre	Clinical Nurse Specialist
Karen Sutherland	St. Joseph's Health Care London Parkwood Hospital	Service Lead, Specialized Community Stroke Rehabilitation Team
Occupational Therapy		
David Ure	Parkwood Hospital	Coordinator, Community Stroke Rehabilitation Team
Rebecca Fleck	Hamilton Health Sciences Centre	Regional Stroke Educator and Research Coordinator
Physiotherapy		
Sara McEwen	Sunnybrook Research Institute, St. John's Rehab	Research Scientist

Name	Affiliation(s)	Appointment(s)
Stefan Pagliuso	Hamilton Health Sciences Centre	Regional Stroke Rehabilitation, Community and LTC Coordinator
Speech/Language Pathology		
Holly Sloan	Trillium Health Centre	
Social Work		
Joanne Avery	Providence Healthcare, Out-patient Stroke Clinic	Social Worker
Administration		
Christina O'Callaghan	Ontario Stroke Network (OSN)	Executive Director
Jim Lumsden	The Ottawa Hospital, LHIN-Champlain Regional Stroke Program	Director
Paula Gilmore	London Health Sciences Centre, Southwestern Ontario Stroke Strategy	Community and Long Term Care Coordinator
Mathew Meyer	Ontario Stroke Network (OSN)	
Joan Southam	CBI-LHIN	Home Health Senior Manager and Project Specialist
Patient Representation		
Daniel Brouillard	Kingston Heart Clinic	Internist, Stroke Survivor
Nicole Martyn-Capobianco	University of Guelph-Humber	Program Head of Human Services

Appendices

Appendix 1: Literature Search Strategies

Search date: December 4, 2013

Databases searched: OVID MEDLINE, MEDLINE In-Process and Other Non-Indexed Citations, All EBM Databases (see below)

Q: What is the impact of self-management or educational programs on hospital admission rates and quality of life for the post-acute population in the community?

Limits: 2008-current; English

Filters: Meta-analyses, systematic reviews, health technology assessments

Database: EBM Reviews - Cochrane Database of Systematic Reviews <2005 to October 2013>, EBM Reviews - ACP Journal Club <1991 to November 2013>, EBM Reviews - Database of Abstracts of Reviews of Effects <4th Quarter 2013>, EBM Reviews - Cochrane Central Register of Controlled Trials <October 2013>, EBM Reviews - Cochrane Methodology Register <3rd Quarter 2012>, EBM Reviews - Health Technology Assessment <4th Quarter 2013>, EBM Reviews - NHS Economic Evaluation Database <4th Quarter 2013>, Ovid MEDLINE(R) <1946 to November Week 3 2013>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <December 03, 2013>

Search Strategy:

#	Searches	Results
1	exp Patient Discharge/	19905
2	exp Aftercare/ or exp Convalescence/	10298
3	"Continuity of Patient Care"/ or exp "Recovery of Function"/	49399
4	((patient* adj2 discharge*) or after?care or post medical discharge* or post?discharge* or convalescen*).ti,ab.	37856
5	exp Stroke/	89117
6	exp brain ischemia/ or exp intracranial hemorrhages/	132313
7	(stroke or poststroke or tia or transient ischemic attack or ((cerebral vascular or cerebrovascular) adj (accident* or infarct*)) or CVA or cerebrovascular apoplexy or brain infarct* or (brain adj2 isch?emia) or (cerebral adj2 isch?emia) or (intracranial adj2 h?emorrhag*) or (brain adj2 h?emorrhag*).ti,ab.	200098
8	exp Heart Failure/	93122
9	((cardia? or heart) adj (decompensation or failure or incompetence or insufficiency)) or cardiac stand still or ((coronary or myocardial) adj (failure or insufficiency)).ti,ab.	135794
10	exp Pulmonary Disease, Chronic Obstructive/	26665
11	exp Emphysema/	11098
12	(copd or coad or chronic airflow obstruction* or (chronic adj2 bronchitis) or emphysema).ti,ab.	60019
13	(chronic obstructive adj2 (lung* or pulmonary or airway* or airflow* or respiratory or bronchopulmonary) adj (disease* or disorder*).ti,ab.	37764
14	exp Pneumonia/	78260
15	(pneumoni* or peripneumoni* or pleuropneumoni* or lobitis or ((pulmon* or lung*) adj inflammation*).ti,ab.	147292
16	or/1-15	779439
17	exp Self Care/	44531
18	exp self efficacy/	13541
19	health education/ or exp consumer health information/ or exp patient education as topic/	133177
20	(selfmanage* or self manage* or selfcare or self care or selfmedication or self medication or selfmonitor* or self monitor* or selfefficac* or self efficac* or ((patient* or carer* or caregiver*) adj2 (information or educat*)).ti,ab.	79092
21	or/17-20	225095
22	16 and 21	12667
23	Meta Analysis.pt.	52732
24	Meta-Analysis/ use mesz or exp Technology Assessment, Biomedical/ use mesz	61456
25	(meta analy* or metaanaly* or pooled analysis or (systematic* adj2 review*) or published studies or published literature or medline or embase or data synthesis or data extraction or cochrane).ti,ab.	211031
26	((health technolog* or biomedical technolog*) adj2 assess*).ti,ab.	2742
27	or/23-26	227543
28	22 and 27	457
29	limit 28 to (english language and yr="2008 -Current") [Limit not valid in CDSR,ACP Journal Club,DARE,CCTR,CLCMR; records were retained]	254
30	remove duplicates from 29	207

Appendix 2: Quality-Assessment Tables

Table A1: AMSTAR Score of Systematic Reviews^a

Author, Year	AMSTAR Score ^a	1) Provided Study Design	2) Duplicate Study Selection	3) Broad Literature Search	4) Considered Status of Publication	5) Listed Excluded Studies	6) Provided Characteristics of Studies	7) Assessed Scientific Quality	8) Considered Quality in Report	9) Methods to Combine Appropriate	10) Assessed Publication Bias	11) Stated Conflict of Interest
Forster et al, 2012 (2)	9	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Lennon et al, 2013 (8)	7	✓	✓	✓	✓	✓		✓	✓			
Ditewig et al, 2010 (9)	8	✓	✓	✓		✓	✓	✓	✓			✓
Wakefield et al, 2013 (10)	8	✓		✓	✓	✓	✓		✓	✓	✓	✓
Tan et al, 2012 (11)	9	✓	✓	✓	✓	✓		✓	✓	✓	✓	
Effing et al, 2009 (12)	8	✓	✓	✓	✓	✓		✓	✓	✓		

Abbreviations: AMSTAR, Assessment of Multiple Systematic Reviews.

^aDetails of AMSTAR method are described in Shea et al (6;12).

Table A2: Risk of Bias for All Studies included in the Wakefield et al Systematic Review

Author, Year ^a	Allocation Concealment	Blinding	Complete Accounting of Patients and Outcome Events	Selective Reporting Bias	Other Limitations
Benatar et al, 2003 (13)	No serious limitations	Serious limitations	No serious limitations	No serious limitations	No serious limitations
Cline et al, 1998 (14)	No Serious limitations	Serious limitations	No serious limitations	No serious limitations	No serious limitations
DeWalt et al, 2006 (15)	No serious limitations	Serious limitations	No serious limitations	No serious limitations	No serious limitations
Doughty et al, 2002 (16)	No serious limitations	Serious limitations	No serious limitations	No serious limitations	No serious limitations
Dunagan et al, 2005 (17)	No serious limitations	Serious limitations	No serious limitations	No serious limitations	No serious limitations
Goldberg et al, 2003 (18)	No serious limitations	Serious limitations	No serious limitations	No serious limitations	No serious limitations
Grancelli et al, 2003 (19)	No serious limitations	Serious limitations	No serious limitations	No serious limitations	No serious limitations
Harrison et al, 2002 (20)	No serious limitations	Serious limitations	No serious limitations	No serious limitations	No serious limitations
Jerant et al, 2001 (21)	No serious limitations	Serious limitations	No serious limitations	No serious limitations	No serious limitations
Jerant et al, 2003 (22)	No serious limitations	Serious limitations	No serious limitations	No serious limitations	No serious limitations
Kasper et al, 2002 (23)	No serious limitations	Serious limitations	No serious limitations	No serious limitations	No serious limitations
Naylor et al, 2004 (24)	No serious limitations	Serious limitations	No serious limitations	No serious limitations	No serious limitations
Nucifora et al, 2006 (25)	No serious limitations	Serious limitations	No serious limitations	No serious limitations	No serious limitations
Rich et al, 1993 (26)	No serious limitations	Serious limitations	No serious limitations	No serious limitations	No serious limitations
Rich et al, 1995 (27)	No serious limitations	Serious limitations	No serious limitations	No serious limitations	No serious limitations
Riegel et al, 2006 (28)	No serious limitations	Serious limitations	No serious limitations	No serious limitations	No serious limitations
Schwarz et al, 2008 (29)	No serious limitations	Serious limitations	No serious limitations	No serious limitations	No serious limitations
Thompson et al, 2005 (30)	No serious limitations	Serious limitations	No serious limitations	No serious limitations	No serious limitations
Wakefield et al, 2008 (31)	No serious limitations	Serious limitations	No serious limitations	No serious limitations	No serious limitations
Woodend et al, 2008 (32)	No serious limitations	Serious limitations	No serious limitations	No serious limitations	No serious limitations

^aBoth HRQoL and hospital admissions were measured.

Table A3: GRADE Evidence Profile for the Systematic Reviews

No. of Studies (Design)	Risk of Bias	Inconsistency	Indirectness	Imprecision	Publication Bias	Upgrade Considerations	Quality
Hospital Admissions							
<i>CHF</i>							
21 (RCTs)	No serious limitations	No serious limitations	Serious limitations (-1)	No serious limitations	Undetermined	None	⊕⊕⊕Moderate
<i>COPD</i>							
15 (RCTs)	No serious limitations	No serious limitations	Serious limitations (-1)	No serious limitations (-1)	Undetermined	None	⊕⊕⊕Moderate
Health-Related Quality of Life							
<i>Stroke</i>							
13 (RCTS)	No serious limitations	Serious limitations (-1)	Serious limitations (-1)	No serious limitations	Undetermined	None	⊕⊕ Low
<i>CHF</i>							
20 (RCTs)	No serious limitations	No serious limitations	Serious limitations (-1)	No serious limitations	Undetermined	None	⊕⊕⊕Moderate
<i>COPD</i>							
16 (RCTs)	No serious limitations	No serious limitations	Serious limitations (-1)	No serious limitations	Undetermined	None	⊕⊕⊕Moderate
Activity of Daily Living							
<i>Stroke</i>							
8 (RCTs)	No serious limitations	No serious limitations	Serious limitations (-1)	No serious limitations	Undetermined	None	⊕⊕⊕Moderate

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Health Quality Ontario
130 Bloor Street West, 10th Floor
Toronto, Ontario
M5S 1N5
Tel: 416-323-6868
Toll Free: 1-866-623-6868
Fax: 416-323-9261
Email: EvidenceInfo@hqontario.ca
www.hqontario.ca

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