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Community Versus Inpatient Rehabilitation in Hip Fracture Patients: A Rapid Review

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Conflict of Interest Statement

All reports prepared by the Division of Evidence Development and Standards at Health Quality Ontario are impartial. There are no competing interests or conflicts of interest to declare.

Rapid Review Methodology

Clinical questions are developed by the Division of Evidence Development and Standards 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 (SRs), health technology assessments, and meta-analyses; if none are located, the search is expanded to include randomized controlled trials (RCTs), and guidelines. Systematic reviews are evaluated using a rating scale developed for this purpose. If the SR 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 SR has not evaluated the primary studies using GRADE, the primary studies included in the SR are retrieved and a maximum of two outcomes are graded. If no well-conducted SRs are available, RCTs and/or guidelines are evaluated. Because rapid reviews are completed in very short timeframes, other publication types are not included. All rapid reviews are developed and finalized in consultation with experts.

Disclaimer

This rapid review is the work of the Division of Evidence Development and Standards 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 to the date of the literature search specified in the Research Methods section, as appropriate. This rapid review may be superseded by an updated publication on the same topic.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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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. Health Quality Ontario works with clinical experts, scientific collaborators, and field evaluation partners to develop and publish research that evaluates the effectiveness and cost-effectiveness of health technologies and services in Ontario.

Based on the research conducted by Health Quality Ontario and its partners, the Ontario Health Technology Advisory Committee (OHTAC)—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 policymakers.

Rapid reviews, evidence-based analyses and their corresponding OHTAC recommendations, and other associated reports are 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, Health Quality Ontario and/or its research partners reviews the available scientific literature, making every effort to consider all relevant national and international research; collaborates with partners across relevant government branches; consults with clinical and other external experts and developers of new health technologies; and solicits any necessary supplemental information.

In addition, Health Quality Ontario 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 can 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.

Permission Requests

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List of Abbreviations

ADL	Activities of Daily Living
AMSTAR	Assessment of Multiple Systematic Reviews
CI	Confidence interval
FIM	Functional Independence Measure
HQO	Health Quality Ontario
MBI	Modified Barthel Index
MD	Mean difference
NCGC	National Clinical Guideline Centre
NICE	National Institute for Health and Clinical Excellence
RCT	Randomized controlled trial
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 Funding (QBF) 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 Funding initiative, visit www.hqontario.ca.

Objective of Analysis

This rapid review aims to determine the effectiveness of inpatient versus community-based rehabilitation among hip fracture patients.

Clinical Need and Target Population

Rehabilitation through inpatient, outpatient, or home-based physiotherapy is an essential component of care after hip fracture surgery. (1) The high cost of hospitalizations coupled with the increased chance for iatrogenic complications from an extended hospital stay, especially for older patients, warrant study of alternatives to inpatient rehabilitation. (2;3) Community and home-based rehabilitation have been shown to be an effective and low-cost way for patients to recover from hip fracture surgery. (1-4) Therefore, it is important to evaluate the effectiveness of inpatient versus community-based rehabilitation among hip fracture patients.

The National Hip Fracture Toolkit by Bone and Joint Decade Canada notes three main rehabilitation settings: inpatient, community-based, and supportive living environments. The toolkit defines inpatient rehabilitation as any form of rehabilitation in a freestanding facility or hospital; community-based as rehabilitation where extensive home services are available; and supportive living as rehabilitation in a place that offers assistance in living, such as a nursing home or lodge. (5)

Rapid Review

Research Question

What is the effectiveness of inpatient rehabilitation compared with community-based rehabilitation for hip fracture patients?

Research Methods

Literature Search

A literature search was performed on February 12, 2013, 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, 2002, until February 12, 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, 2002, and February 12, 2013
- RCTs, SRs, meta-analyses, and guidelines
- adult hip fracture population
- studies comparing inpatient, or usual care, rehabilitation to community-based rehabilitation[a]

[a]Community-based rehabilitation was defined by The National Hip Fracture Toolkit as any rehabilitation approaches where extensive home care is available. (5)

Exclusion Criteria

- studies where outcomes of interest cannot be extracted

Outcomes of Interest

- up to two Activities of Daily Living (ADL), with the following order of priority, as available:
    1. Functional Independence Measure (FIM)
    2. Instrumental ADL
    3. Any other ADL
- length of rehabilitation

Expert Panel

In December 2012, an Expert Advisory Panel on Episodes of Care for Hip Fractures was struck. Members of the panel included physicians, personnel from the Ministry of Health and Long-Term Care, and representatives from the community.

The role of the Advisory Panel was to place the evidence produced by Health Quality Ontario in context and to provide advice about the appropriate clinical pathway for a hip fracture in the Ontario health care

setting. However, the statements, conclusions, and views expressed in this report do not necessarily represent the views of Advisory 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 factors that could raise the quality of evidence were considered: large magnitude of effect, dose-response gradient, and accounting for all residual 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 Literature Search

The database search yielded 786 citations published between January 1, 2002, and February 12, 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.

Six SRs were identified that evaluate the effectiveness of inpatient rehabilitation versus community-based rehabilitation, with AMSTAR ratings ranging from 5 to 9. (1;3;8-11) Among these, 3 SRs meet the inclusion criteria. (3;8;9) Two of these reviews use the Modified Barthel Index (MBI) as a tool to evaluate ADL (3;9); 1 evaluates the FIM as an outcome (8); and all 3 report on length of stay. (3;8;9) All 3 SRs were, therefore, reviewed by AMSTAR. (Appendix 2, Table A1)

The SR by the National Clinical Guideline Centre (NCGC) that was fed into the National Institute for Health and Clinical Excellence (NICE) Guidelines received an AMSTAR rating of 9. (8) The reviews by Chudyk et al (9) and Stolee et al (3) received AMSTAR scores of 3 and 9, respectively. (Appendix 2, Table A1) Because the NCGC/NICE SR was published more recently, captures the same literature as the other reviews, and has the highest AMSTAR rating, this review was selected for the current analysis. (8)

The NCGC defines community-based rehabilitation as including any rehabilitation approaches that are based in a patient's own home, community hospital, residential care unit, or a Social Care Unit. (8) This coincides with the definition for community-based rehabilitation provided by the National Hip Fracture Toolkit. (5) Of note, this review focuses specifically on *multidisciplinary* rehabilitation in the community rather than on inpatient care. (8)

The SR by NCGC/NICE is summarized in Table 1.

Table 1. Summary of Systematic Review Included

Author, Year	Review Type	Search Dates	Inclusion Criteria	No. of RCTs	AMSTAR Score
NCGC/NICE, 2011 (8)	SR	To August 2010	RCTs English-language only Patients aged ≥ 18 years with intracapsular or extracapsular hip fracture treatment of multidisciplinary rehabilitation	2	9

Abbreviations: AMSTAR, Assessment of Multiple Systematic Reviews ; NCGC, National Clinical Guideline Centre; NICE, National Institute for Health and Clinical Excellence; No., number; RCTs, randomized controlled trials ; SR, systematic review

Results for Outcomes of Interest

The SR by NCGC/NICE (8) provides the GRADE level of evidence for FIM and length of rehabilitation. While this review does not directly assess MBI as an outcome, it does include an RCT (2) that reports on MBI. (8) This RCT (2) was therefore pulled, and the GRADE was separately assessed.

Functional Independence Measure

The FIM is an 18-item questionnaire that assesses a patient's level of disability in terms of burden of care. The score for each individual item ranges from 1 to 7; a higher score indicates more independence. The FIM can generate a few separate scores: a total score, a self-care score, a locomotion score, and a mobility score. (12)

The results from the NCGC/NICE (8) SR are summarized in Table 2. The review reported one RCT for this outcome (13), which received a high quality score according to GRADE. (8)

Ziden et al published a subsequent paper to document the long-term measures for this same study at 12 months after discharge. (14) This RCT was pulled, and the two RCTs by Ziden et al (13;14) were treated as one to measure short-term (1-month follow-up) and long-term (12-month follow-up) FIM scores. The NCGC/NICE SR identifies an increase in mobility, self-care, and locomotion FIM scores with community-based rehabilitation over scores with inpatient care (mean difference [MD] 4.90, 95% confidence interval [CI] 2.81–6.99) (8) in the short-term. Long-term results from Ziden et al, 2010, also showed significantly higher total, self-care, and locomotion FIM scores for the community-based rehabilitation group than for inpatient care. (14)

Table 2. Systematic Review and Follow-up Study on Functional Independence Measure

Author, Year	Sample Size	Inclusion/Exclusion Comparison Group	FIM Scores[a]	GRADE
Ziden et al, 2008 and 2010 (13;14)	**Short-term:** 102 patients **Long-term:** 93 patients	**Inclusion**: Aged 65 or older, approved by geriatrician for needing geriatric care and rehabilitation, able to speak and understand Swedish **Exclusion**: Severe mental illness, expected survival less than 1 year, drug or alcohol abuse, cognitive impairment **Home rehabilitation group**: Conventional care and rehabilitation same as control group. Home rehabilitation consisted of 3-week intervention period **Usual care (inpatient) group**: Participation in standard rehabilitation with physiotherapy and occupational therapy sessions	**Baseline, Mean (SD)**:[b] ***Community Rehabilitation*** Self-care: 40.6 (2.5) Mobility: 20.3 (1.3) Locomotion: 12.2 (3.2) ***Inpatient Rehabilitation*** Self-care: 40.5 (2.9) Mobility: 20.1 (1.4) Locomotion: 11.6 (3.0) **Short-term, MD (95% CI)**:[c] Self-care**:** 4.90 (2.81, 6.99)[d] Mobility: 2.00 (1.02, 2.98)[d] Locomotion: 2.80 (1.61, 3.99)[d] **Long-term, median (min-max):**[e] ***Community Rehabilitation***[f] Total FIM: 85 (46-91) Self-care: 40 (23-42) Locomotion: 32 (11-35) ***Inpatient Rehabilitation***[e] Total FIM: 80 (29-91) Self-care: 38 (12-42) Locomotion: 29 (9-35)	High[g]

Abbreviations: CI, confidence interval; FIM, Functional Independence Measure; MD, mean difference; NCGC, National Clinical Guideline Centre; NICE, National Institute for Health and Clinical Excellence; RCT, randomized controlled trial; SD, standard deviation

[a] Dissimilarity between measurements is an unfortunate limitation of the study; converting to the same unit reduces accuracy in measurement.

[b] Ziden et al, 2008, reported no significant difference between the two arms at baseline (13)

[c] $p<0.05$ for all measures of FIM in short-term follow-up (1 month) (13)

[d] NCGC/NICE review found to be statistically significant with $p<0.00001$ (8)

[e] NCGC/NICE review did not evaluate long-term FIM. (8) Ziden et al, 2010 did not report mean or SDs. Long-term FIM scores for locomotion were not reported either, but total FIM score was reported (14)

[f] Ziden et al, 2010, reported statistically significant difference between the two arms for all measures of FIM, with $p<0.05$ (14)

[g] GRADE assessed directly by NCGC/NICE. (8) Authors did not downgrade

Activities of Daily Living

The review by NCGC/NICE does not report on any tool that measures ADL, except for FIM. (8) It does, however, identify one RCT (2) that reports MBI as an outcome, but the authors do not evaluate this outcome.

Modified Barthel Index

The MBI is a ten-item questionnaire that assesses the level of an individual's functional independence in ADLs. (12) The score ranges from 0 to 100, with a higher score indicating less dependence. (15)

The NCGC/NICE SR (8) identifies, but does not evaluate, the RCT by Crotty et al (2), which assesses the MBI as an outcome. Crotty et al published a subsequent paper to document the long-term outcome measures 12 months after rehabilitation. (16) Both RCTS by Crotty et al (2;16) were pulled and treated as one RCT that measures short-term (6 months post-discharge) and long-term (12 months post-discharge) outcomes. The results found a greater improvement in MBI from baseline in the short term for patients receiving community-based multidisciplinary rehabilitation than for those receiving inpatient rehabilitation, but no difference between the groups in the long term. The GRADE for this outcome was assessed as low (Appendix 1, Table A2, and Table A3).

Table 3. Modified Barthel Index as a Tool to Measure Activities of Daily Living

Author, Year	Sample Size	Group Characteristics	MBI Score, Mean (95% CI)[a]	GRADE
Crotty et al, 2002[b] and 2003[c] (2;16)	**Short-term**: 66 patients **Long-term**: 60 patients	**Inclusion**: medically stable, age 65 or more, physically and mentally capable of participating in rehabilitation, and suitable home environment for rehabilitation **Exclusion**: inadequate patient support at home, no phone, out of region **Home rehabilitation group**: patients were discharged within 48 hours of surgery. Standard therapy services podiatry, nursing care, and help with light tasks, were provided. **Usual care (inpatient) group**: conventional care within the hospital was provided.	**Baseline**: Usual (Inpatient) care: 85.0 (77.0-89.0) Home care: 85.0 (79.0-89.0) **Short-term**:** Usual (Inpatient) care: 94.0 (83.7-97.0) Home care: 97.0 (93.5-99.0) **Long-term**:* Usual (Inpatient) care: 97.0 (85.3-100.0) Home care: 97.0 (92.3-100.0)	Low[a]

Abbreviations: CI, confidence interval; MBI, Modified Barthel Index; MD, mean difference; NCGC, National Clinical Guideline Centre; NICE, National Institute for Health and Clinical Excellence

[a]The outcome of MBI, as well as its GRADE assessment, was not evaluated by the NICE/NCGC review (8)

[b]Crotty et al, 2002, reported a statistically significant difference between the inpatient and community-based rehabilitation groups at 6 months post-discharge ($p<0.05$) (2)

[c]Crotty et al, 2003, reported that there was no statistically significant difference between the arms at 12 months postdischarge ($p>0.05$) (16)

Length of Stay

The results from the NCGC/NICE SRare summarized in Table 4. The review identifies one RCT by Crotty et al, 2002 (2) to report on the outcome of length of rehabilitation stay. Review authors found a statistically significant increase in total length of rehabilitation (hospital + home) with community-based

multidisciplinary care over inpatient care (MD 14.0, 95% CI 7.9, 20.1), on the basis of moderate GRADE quality of evidence. (8)

Table 4. Systematic Review of Length of Rehabilitation (Days in Hospital + Home)

Author, Year	No. of RCTs	Community-Based Rehabilitation, Days (min, max)	Usual Care (Inpatient) Rehabilitation	MD (95% CI)	P	GRADE
NCGC/NICE, 2011 (8)	1	28.3 (23.1, 33.6)	14.3 (10.5, 18.1)	14.0 (7.9, 20.1)	<0.00001	Moderate[a]

Abbreviations: CI, confidence interval; MD, mean difference; NCGC, National Clinical Guideline Centre; NICE, National Institute for Health and Clinical Excellence; No., number; RCT, randomized, controlled trial
[a]GRADE assessed directly by NCGC/NICE (8); Authors downgraded for study quality

Conclusions

On the basis of one SR evaluating the effectiveness of inpatient rehabilitation in comparison with community-based rehabilitation among hip fracture patients, the following conclusions were reached:

- High-quality evidence shows the total FIM improved among patients receiving community-based rehabilitation versus inpatient rehabilitation;
- Low-quality evidence indicates the total MBI is not significantly different among patients receiving community-based rehabilitation than among those receiving inpatient rehabilitation;
- Moderate-quality evidence indicates patients receiving community-based multidisciplinary rehabilitation have longer stays in rehabilitation (hospital + home) than those receiving inpatient rehabilitation.

The results primarily reflect cognitively intact and medically stable adults older than 65 with high prefracture mobility and independence and might not represent the effectiveness of community versus inpatient rehabilitation among less mobile and more dependent adults.

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Expert Panel for Health Quality Ontario: Episode of Care for Hip Fracture

Name	Role	Organization
Chair		
Dr. James Waddell	Orthopedic surgeon	St. Michael's Hospital, Toronto
Orthopedic Surgery		
Dr. John P. Harrington	Orthopedic surgeon	William Osler Health System, Toronto
Dr. Mark Harrison	Orthopedic surgeon	Queen's University, Kingston
Dr. Hans J. Kreder	Professor	Division of Orthopaedics, Department of Surgery, University of Toronto
Dr. Allan Liew	Orthopedic surgeon	Department of Surgery, University of Ottawa
Dr. Mark MacLeod	Orthopedic surgeon	London Health Sciences Centre
Dr. Aaron Nauth	Orthopedic surgeon	St. Michael's Hospital/University of Toronto
Dr. David Sanders	Orthopedic surgeon	London Health Sciences Centre
Dr. Andrew Van Houwelingen	Orthopedic surgeon	St. Thomas Elgin General Hospital
Anesthesiology		
Dr. Nick Lo	Staff anesthesiologist	St. Michael's Hospital, Toronto
Emergency Medicine		
Dr. Michael O'Connor	Emergency medicine	Kingston General Hospital
Dr. Lisa Shepherd	Emergency medicine	South West Local Health Integration Network (LHIN), London
Family Medicine		
Dr. Christopher Jyu	Physician lead, primary care	Central East LHIN, Ajax
Geriatrics		
Dr. Anna Byszewski	Geriatrician	The Ottawa Hospital
Dr. Maria Zorzitto	Chief of geriatric medicine	St. Michael's Hospital, Toronto
Physiotherapy		
Ruth Vallis	Physiotherapist	University Health Network, Toronto
Rehabilitation		
Charissa Levy	Executive director	GTA Rehab Network
Dr. Peter Nord	Vice president, chief medical officer and chief of staff	Providence Healthcare, Toronto
Research		
Dr. Susan Jaglal	Chair	Toronto Rehabilitation Institute, University of Toronto

Name	Role	Organization
Dr. Valerie Palda	Associate professor	Department of Medicine and Institute of Health Policy, Management and Evaluation, University of Toronto
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Jane de Lacy	Executive director, patient services	William Osler Health System, Toronto
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Jo-anne Marr	Executive vice president and chief operating officer	Mackenzie Health, Richmond Hill
Malcolm Moffat	Executive vice president, programs	Sunnybrook Health Sciences Centre, Toronto
Kathy Sabo	Senior vice president, clinical programs/operations	University Health Network, Toronto
Community Care Access Centres		
Patricia (Tricia) Khan	Senior director, client services	Erie St. Clair Community Care Access Centre, Chatham
Janet McMullan	Project director, consultant	Bone and Joint Decade Canada
Professional Organizations		
Ravi Jain	Director, Ontario osteoporosis strategy	Osteoporosis Canada
Rhona McGlasson	Executive director	Bone and Joint Decade Canada

Appendices

Appendix 1: Literature Search Strategies

Search date: February 12, 2013
Databases searched: Ovid MEDLINE, MEDLINE In-Process and Other Non-Indexed Citations, Embase; Cumulative Index to Nursing and Allied Health (CINAHL); Cochrane Library; Centre for Reviews and Dissemination (CRD)
Limits: 2002-current; English
Filters: Meta-analysis, systematic reviews, heath technology assessments, RCTs, and guidelines

Database: Ovid MEDLINE(R) <1946 to January Week 5 2013>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <February 11, 2013>, Embase <1980 to 2013 Week 06>
Search Strategy:

#	Searches	Results
1	exp Hip Fractures/ use mesz	16222
2	exp Hip Fracture/ use emez	26495
3	((hip* or femur* or femoral* or trochant* or petrochant* or intertrochant* or subtrochant* or intracapsular* or extracapsular*) adj4 fracture*).ti,ab.	55825
4	((hip* or ((femur* or femoral*) adj3 (head or neck or proximal))) adj4 fracture*).ti,ab.	38575
5	or/1-4	69278
6	exp Rehabilitation/	332918
7	Rehabilitation Nursing/	1961
8	exp Rehabilitation Centers/ use mesz	11332
9	exp rehabilitation center/ use emez	8264
10	exp "Physical and Rehabilitation Medicine"/ use mesz	18976
11	exp rehabilitation medicine/ use emez	4537
12	exp rehabilitation research/ use emez	284
13	exp rehabilitation care/ use emez	7452
14	exp Hip Fractures/rh [Rehabilitation]	2151
15	exp hip fracture/rh [Rehabilitation]	2151
16	exp Physical Therapy Modalities/ use mesz	114382
17	exp physical medicine/ use emez	363451
18	exp mobilization/ use emez	15408
19	(rehabilitat* or habilitat* or movement therap* or physiotherap* or physical therap* or exercis* or occupational therap* mobili?ation or strength train*).ti,ab.	655369
20	or/6-19	1281990
21	Meta Analysis.pt.	36967
22	Meta Analysis/ use emez	68832
23	Systematic Review/ use emez	57208
24	exp Technology Assessment, Biomedical/ use mesz	8791
25	Biomedical Technology Assessment/ use emez	11440
26	(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.	302266
27	((health technolog* or biomedical technolog*) adj2 assess*).ti,ab.	3953
28	exp Random Allocation/ use mesz	76124
29	exp Double-Blind Method/ use mesz	117322
30	exp Control Groups/ use mesz	1362
31	exp Placebos/ use mesz	31199
32	Randomized Controlled Trial/ use emez	336877
33	exp Randomization/ use emez	60702
34	exp Random Sample/ use emez	4568
35	Double Blind Procedure/ use emez	113044
36	exp Triple Blind Procedure/ use emez	37
37	exp Control Group/ use emez	41888
38	exp Placebo/ use emez	212539
39	(random* or RCT).ti,ab.	1412123

40	(placebo* or sham*).ti,ab.	454632
41	(control* adj2 clinical trial*).ti,ab.	39053
42	exp Practice Guideline/ use emez	285751
43	exp Professional Standard/ use emez	275459
44	exp Standard of Care/ use mesz	620
45	exp Guideline/ use mesz	23122
46	exp Guidelines as Topic/ use mesz	102366
47	(guideline* or guidance or consensus statement* or standard or standards).ti.	222418
48	(controlled clinical trial or meta analysis or randomized controlled trial).pt.	455849
49	or/21-48	3032841
50	5 and 20 and 49	1269
51	limit 50 to english language	1163
52	limit 51 to yr="2002 -Current"	914
53	remove duplicates from 52	695

Cumulative Index to Nursing and Allied Health (CINAHL)

#	Query	Limiters/Expanders	Results
S1	(MH "Hip Fractures+")	Search modes - Boolean/Phrase	3,713
S2	((hip* or femur* or femoral* or trochant* or petrochant* or intertrochant* or subtrochant* or intracapsular* or extracapsular*) N4 fracture*)	Search modes - Boolean/Phrase	6,343
S3	((hip* or ((femur* or femoral*) N3 (head or neck or proximal))) N4 fracture*)	Search modes - Boolean/Phrase	5,032
S4	S1 OR S2 OR S3	Search modes - Boolean/Phrase	6,352
S5	(MH "Rehabilitation+")	Search modes - Boolean/Phrase	130,686
S6	(MH "Rehabilitation Nursing")	Search modes - Boolean/Phrase	1,982
S7	(MH "Rehabilitation Centers+")	Search modes - Boolean/Phrase	5,305
S8	(MH "Hip Fractures+/RH")	Search modes - Boolean/Phrase	487
S9	(MH "Physical Therapy Practice, Evidence-Based")	Search modes - Boolean/Phrase	1,172
S10	(MH "Physical Medicine")	Search modes - Boolean/Phrase	821
S11	(rehabilitat* or habilitat* or movement therap* or physiotherap* or physical therap* or exercis* or occupational therap* mobili?ation or strength train*)	Search modes - Boolean/Phrase	179,950
S12	S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11	Search modes - Boolean/Phrase	231,805
S13	S4 AND S12	Search modes - Boolean/Phrase	1,297
S14	(MH "Random Assignment") or (MH "Random Sample+") or (MH "Meta Analysis") or (MH "Systematic Review") or (MH "Double-Blind Studies") or (MH "Single-Blind Studies") or (MH "Triple-Blind Studies") or (MH "Placebos") or (MH "Control (Research)") or (MH "Practice Guidelines") or (MH "Randomized Controlled Trials")	Search modes - Boolean/Phrase	Display
S15	((health technology N2 assess*) or meta analy* or metaanaly* or pooled analysis or (systematic* N2 review*) or published studies or medline or embase or data synthesis or data extraction or cochrane or random* or sham*or rct* or (control* N2 clinical trial*) or	Search modes - Boolean/Phrase	Display

	guideline* or guidance or consensus statement* or standard or standards or placebo*)		
S16	S14 or S15	Search modes - Boolean/Phrase	Display
S17	S13 AND S16	Search modes - Boolean/Phrase	309
S18	S13 AND S16	Limiters - English Language Search modes - Boolean/Phrase	303
S19	S13 AND S16	Limiters - Published Date from: 20020101-20131231; English Language Search modes - Boolean/Phrase	248

Cochrane Library

ID	Search	Hits
#1	MeSH descriptor: [Hip Fractures] explode all trees	968
#2	((hip* or femur* or femoral* or trochant* or petrochant* or intertrochant* or subtrochant* or intracapsular* or extracapsular*) near/4 fracture*):ti (Word variations have been searched)	1418
#3	((hip* or ((femur* or femoral*) adj3 (head or neck or proximal))) near/4 fracture*):ti (Word variations have been searched)	801
#4	#1 or #2 or #3	1712
#5	MeSH descriptor: [Rehabilitation] explode all trees	12263
#6	MeSH descriptor: [Rehabilitation Nursing] explode all trees	33
#7	MeSH descriptor: [Rehabilitation Centers] explode all trees	511
#8	MeSH descriptor: [Physical Therapy Modalities] explode all trees	12803
#9	MeSH descriptor: [Physical Medicine] explode all trees	293
#10	(rehabilitat* or habilitat* or movement therap* or physiotherap* or physical therap* or exercis* or occupational therap* mobili?ation or strength train*):ti (Word variations have been searched)	20590
#11	#5 or #6 or #7 or #8 or #9 or #10	35148
#12	#4 and #11 from 2002 to 2013	111

Centre for Reviews and Dissemination (CRD)

Line	Search	Hits
1	MeSH DESCRIPTOR hip fractures EXPLODE ALL TREES	167
2	((hip* or femur* or femoral* or trochant* or petrochant* or intertrochant* or subtrochant* or intracapsular* or extracapsular*) adj4 fracture*)):TI	126
3	((hip* or ((femur* or femoral*) adj3 (head or neck or proximal))) adj4 fracture*)):TI	104
4	#1 OR #2 OR #3	212
5	MeSH DESCRIPTOR rehabilitation EXPLODE ALL TREES	1376
6	MeSH DESCRIPTOR rehabilitation nursing EXPLODE ALL TREES	6
7	MeSH DESCRIPTOR rehabilitation centers EXPLODE ALL TREES	74
8	MeSH DESCRIPTOR physical therapy modalities EXPLODE ALL TREES	1588
9	MeSH DESCRIPTOR physical medicine EXPLODE ALL TREES	88
10	(rehabilitat* or habilitat* or movement therap* or physiotherap* or physical therap* or exercis* or occupational therap* mobili?ation or strength train*):TI	1291
11	#5 OR #6 OR #7 OR #8 OR #9 OR #10	2962
12	#4 AND #11	19
13	(#12):TI FROM 2002 TO 2013	12

Appendix 2: Quality-Assessment Tables

Table A1: AMSTAR Score of 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
NICE/NCGC, 2011 (8)	9	✓		✓	✓	✓	✓	✓	✓	✓		✓
Stollee et al, 2011 (3)	8		✓	✓	✓		✓	✓	✓			✓
Chudyk et al, 2009 (9)	5		✓	✓			✓	✓	✓			

Abbreviations: AMSTAR, Assessment of Multiple Systematic Reviews; NCGC, National Clinical Guideline Centre; NICE, National Institute for Clinical Excellence

a details of AMSTAR method are described in Shea et al (6)

Table A2: Risk of Bias for All Studies included in the NCGC/NICE Systematic Review of Community-Based Rehabilitation versus Inpatient Rehabilitation

Source Author, Year	Allocation Concealment	Blinding	Complete Accounting of Patients and Outcome Events	Selective Reporting Bias	Other Limitations
Crotty et al, 2002 and 2003 (2;16)[a]	No serious limitations	Serious limitations[b]	Serious limitations[c]	No serious limitations	Serious limitations[d]
Ziden et al, 2008 and 2010 (13;14)[a]	No serious limitations	Serious limitations[b]	No serious limitations	Serious limitations[e]	No serious limitations

Abbreviations: FIM, Functional Independence Measure; NCGS, National Clinical Guideline Centre; NICE, National Institute for Clinical Excellence
[a] Both studies treated as one, reporting short- and long-term results
[b] Assessors were blinded to treatment allocation, but trial participants were not blinded.
[c] While the loss to follow-up and death were fully reported, the 3 lost to follow-up were all in the accelerated care group.
[d] Very poor description of the inpatient group in the study. It is unclear whether the intervention group is receiving the same intensity of rehabilitation as the control group
[e] NCGC/NICE (8) did not downgrade for reporting bias, but it is important to note that in the follow-up study by Ziden et al, 2010, mean values and standard deviations are not reported; median values and ranges are reported instead (14). Further, the authors do not report mobility FIM score, but they do report total FIM score. (14)

Table A3: GRADE Evidence Profile for Comparison of Community-Based versus Inpatient Rehabilitation in Hip Fracture Patients

No. of Studies (Design)	Risk of Bias	Inconsistency	Indirectness	Imprecision	Publication Bias	Quality
FIM						
1 (RCT)[a]	No serious limitations[b]	No serious limitations	No serious limitations	No serious limitations	Undetected	⊕⊕⊕⊕ High
ADLs evaluation using MBI[c]						
1 (RCT)[d]	Serious limitations (-1)[e]	No serious limitations	No serious limitations	Serious limitations[f]	Undetected	⊕⊕ Low
Length of Rehabilitation (Hospital + Home)						
1 (RCT)[a]	Serious limitations (-1)[g]	No serious limitations	No serious limitations	No serious limitations	Undetected	⊕⊕⊕ Moderate

Abbreviations: ADL, Activities of Daily Living;, FIM Functional Independence Measure; MBI, Modified Barthel Index; NCGS, National Clinical Guideline Centre; NICE, National Institute for Clinical Excellence; No., number; RCT, randomized controlled trial

[a] This outcome was evaluated for GRADE by NCGC/NICE (8)

[b] Risk of bias was not downgraded by NCGC/NICE (8), despite minor limitations in blinding. There are serious limitations in blinding for the follow-up study that is not reported by NCGC/NICE, but given the same statistical tests were run in the short-term and follow-up studies (13;14), no additional downgrading was done.

[c] GRADE was not assessed by review authors and was based on review of the primary RCT included in the systematic review that assessed the outcome of the MBI

[d] The two RCTs by Crotty et al (2;16) are treated as one RCT, reporting both short- and long-term outcomes

[e] Patients were not blinded, which is likely to bias results for this subjective outcome; all patients lost to follow-up were in the control group, and an inadequate description of comparator groups was provided

[f] The small number of patients gives wide confidence intervals around the estimate effect, making it difficult to know the true effect size for this outcome

[g] NCGC/NICE downgraded, because the baseline data for in each study arm were not given (8)

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